A flood of communications in a drought: A frame analysis of the City of Cape Town's communications during the 2017-2018 water crisis

Erin Hill
HLLERI003

Supervised by:
Dianne Scott
Anna Taylor

A dissertation submitted in partial fulfilment of the requirements for a Master of Philosophy degree.

Department of Environmental and Geographical Science
University of Cape Town
December 2019

Plagiarism declaration

1. I understand that plagiarism is to use and present the work of another as one's own and that plagiarism is wrong. I declare that the contents of this thesis are my own, and any work of others is properly acknowledged.

2. I have used the Harvard UCT convention for citations and references. Any contribution or quotation from the work(s) of another person in this thesis, has been acknowledged, cited and fully referenced.

3. I have not allowed and will not allow anyone to copy my work with the intention of falsely representing it as their own work.

Signature: Signed by candidate Date: January 2020

Abstract

Like many other urban areas around the world, Cape Town, South Africa relies on governmental management authorities to ensure water supply. Recently, a three year drought from 2015 to 2018 caused a major water shortage, threatening water supply to the city. In response, the City engaged in multiple mitigation efforts, amongst which was a major communications campaign to inform the public and encourage conservation behaviour. Drawing on literature on water crisis management and framing theory, this thesis analyses how the water crisis was framed in communications made available online by the City of Cape Town (CCT) to the public between March 2017 and March 2018. To answer this question, the project adopted a frames study approach to determine the types and characteristics of communication items released by the City of Cape Town, as the water managing authority, during the recent water crisis. The study established that a range of frames were employed by the CCT in communicating the drought. Through an analysis of the trends in the framing of the water crisis messages the study further identified the shifts in framing and messaging throughout the water crisis response period. Six key frames were identified, namely 'the City success story'; 'obscurity and ambiguity'; 'consumption is key'; 'the situation is controllable'; 'together we can beat the drought'; and 'us versus them'. It was found that while there may have been a lack of strategic planning regarding public communications which resulted in conflated messages, the City's communications campaign was nonetheless effective in that it correlated with a significant drop in private – individual and household – water consumption which delayed Day Zero (when water supply would be cut-off and daily water rations would only be available at collection points for the public). The key implication of this study is that despite contradictions, idiosyncrasies and lack of planning, a heterogenous range of messages in communicating a crisis can reach and evoke appropriate responses from multiple audiences of the public.

Acknowledgements

First and foremost, I would like to thank my supervisors, Dianne Scott and Anna Taylor, for guiding me through this process. I am eternally grateful for having you both as my team and grappling through this with me every step of the way. Thank you for the endless support, patience and guidance. It would not have been possible to reach this goal without your insightful counsel and unwavering dedication. I am also grateful to UCT's Environmental and Geographical Science department, and the many friendly, intelligent and incredibly helpful members of staff that have shaped my path. The EGS department was my home for the last two years and what a wonderful base it was.

Secondly, I am thankful to my friends and classmates for being able to share this experience – the ups, the downs, the exhaustion and the hysterics. Thank you for being there to bounce ideas around, to share stories and generally making the work processes much better. There was a great comfort in going through this together and knowing we had each others' support and encouragement. A special mention goes to Marte, for literally being by my side throughout. Thank you for the wonderful hours of chats in the office, runs on the mountain to escape and all our other missions together. This Masters has forged a deep bond between us which I will cherish forever. Another special thanks must go to Mikey, for going above and beyond to help me get this thesis done. Thank you for the kind, honest and reassuring words always. Thank you also for distracting me and offering me perspective when I needed it. I cannot imagine seeing this project through to the end without you.

Finally, I would like to express my deepest gratitude to my family for all their support, without which none of this would have been possible. You have witnessed and encouraged me every step of my journey and for that I am extremely blessed. Thank you to my parents, Bridget and Brian, my sister, Kelcey, and my wider family for the unconditional love and for doing everything in your power to make this possible for me. I am eternally grateful for this opportunity and to have had your support along the way. I would also like to extend my thanks to Lalage, my Cape Town mom, for opening your home to me and embracing me so warmly. Thank you all for believing in me and supporting my goals wholeheartedly.

Table of contents

Plagiarism declaration……i

Abstract……..ii

Acknowledgements……...iii

List of figures……...vii

List of tables……vii

Appendices……...vii

List of abbreviations……... viii

Chapter 1…….. 1

Introduction……..1

1.1 Introduction……1

1.2 The study……3

1.3 Wider significance…… 4

1.4 Structure of thesis……...5

Chapter 2…….. 6

Theoretical framework……6

2.1 Introduction……6

2.2 The concept of framing……..7

2.3 Relevance of framing theory to the research question……...9

2.4 Urban water management…… 12

2.5 Water crisis management……13

2.6 Demand-side urban water management and public communications……..15

2.7 Conclusion…….... 16

Chapter 3…… 17

Context…… 17

3.1 Introduction……..17

3.2 Climate, hydrology and geography of Cape Town……..17

3.3 Water management in the City of Cape Town……20

3.4 From drought to water crisis…… 23

3.5 Other actors……..24

3.6 Conclusion…….... 24

Chapter 4……. 26

Research methods……. 26

4.1 Introduction……..26
4.2 Data collection……. 26
4.3 Sampling…….. 27
4.4 Analysis……28
4.5 Limitations and challenges……...31
4.6 Conclusion……... 32
Chapter 5…… 33
The framing of drought crisis communications by the CCT……..33
5.1 Introduction……..33
5.2 Communication item types…….. 33
5.3 Two streams of communication types……. 34
5.4 The identification of framing aspects……...35
5.5 The six main frames used by the CCT in their communications……36
5.5.1 The City success story……..37
5.5.2 Obscurity and ambiguity……..37
5.5.3 Consumption is key…….. 38
5.5.4 The situation is controllable…… 39
5.5.5 Together we can beat the drought……39
5.5.6 Us versus them……. 40
5.6 Frequency of frames……41
5.7 Conclusion……... 42
Chapter 6…… 45
Discussion……45
6.1 Introduction……..45
6.2 A theoretical analysis of the City's framing of the drought……45
6.2.1 'The City success story' – more about the City than success…….. 45
6.2.2 'Obscurity and ambiguity' – a situation too difficult for public understanding……..46
6.2.3 'Consumption is key' – pleading to the public……46
6.2.4 'The situation is controllable' – because the City cannot be out of control……47
6.2.5 'Together we can beat the drought' – united by a common struggle…….. 48
6.2.6 'Us versus them' – the onus is on the public……48
6.3 The temporal trends in the two streams of the City's communications……...49
6.3.1 The build up……. 49

6.3.2 Crisis climax…… 51
6.3.3 New year, new normal…… 54
6.4 City communications – a clear strategic narrative or the product of a less systematic process?.....55
6.4.1 Strong frames and overlapping aspects……...56
6.4.2 Frame pluralism, ambiguity and contradictions……..56
6.4.3 Height of crisis and climax of City response……... 57
6.4.4 Heterogeneity as a strength…… 58
Chapter 7…… 59
Conclusion…….. 59
References…….…..63
Appendix I……..... 71
Initial scoping analysis of data……71
Appendix II……77
Framing aspects identified in the data and key for codes…… 77
Appendix III…….... 81
Frequency of key frames occurring in each item in each stream…….81

List of figures

Figure 2.1 Diagram illustrating the triadic relationships between resource, consumer and water management ……..... 12

Figure 3.1 Map of the City of Cape Town's municipal region ……... 18

Figure 3.2 Map showing the main supply dams in the Western Cape Water Supply System … 19

Figure 3.3 Graph showing the dam storage levels for the Western Cape Water Supply System from 2008 to 2019 …… 20

Figure 4.1 Google Trends results for the term "Cape Town drought" between April 2014 and April 2019 ……... 27

Figure 4.2 Process of abductive approach adapted for this study ……... 29

Figure 5.1 Various types of communication items presented by percentage …….. 34

Figure 5.2 Timeline of frequency of frames occurring in stream A between March 2017 and March 2018…….. 43

Figure 5.3 Timeline of frequency of frames occurring in stream B between March 2017 and March 2018…….. 44

List of tables

Table 3.1 Brief timeline of events of the Cape Town water crisis …… 22

Table 4.1 Types of items sampled ……. 28

Table 5.1 Total number of items in each stream ……... 34

Table 5.2 Framing aspects and associated devices …… 35

Table 5.3 Key frames identified …… 41

Appendices

Appendix I Initial scoping analysis of data …… 71

Appendix II Framing aspects identified in the data and key for codes …… 77

Appendix III Frequency of key frames occurring in each item in each stream ……..…… 81

List of abbreviations

CCT	City of Cape Town
CSAG	Climate Systems Analysis Group
DWS	Department of Water and Sanitation (national department)
IAEA	International Atomic Energy Agency
SDG	Sustainable Development Goals
T140 & T155	Target 140 & Target 155
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCWSS	Western Cape Water Supply System
WRTT	Water Resilience Task Team
WSD	Water and Sanitation Department (municipal department)

Chapter 1

Introduction

1.1 Introduction

Many cities around the world rely on governmental structures for vital resources and services such as energy, water and sanitation.[1] Generally, these provisions are compensated through rates and taxes paid by the public, and this exchange is generally unnoteworthy (Robins, 2019). However, it is significant that in this system the managing authority[2] holds the power of responsibility to ensure supply. When the supply of a resource is threatened by a crisis, it is interesting to note how the managing authority perceive the situation and then interpret and portray that through framing to the public, as a crisis not only threatens the provision of a resource but also the associated power of the infrastructural authority. It is argued here that frames matter in managing a crisis because they are an exertion of the inherent power by the managing authority to influence how the situation is portrayed, perceived, understood and responded to (Laws & Rein, 2003). An analysis of frames illustrates how a narrative is constructed in response to the crisis and how that narrative can dominate the public's perception of the situation[3]. For this reason, it is useful to analyse communications[4] released by managing authorities, to grapple with the messages and identify how they are framed in order to explore strategic narratives, relationships between actors, and power relations constructed through communications.

[1] Though this is not exclusively true, for example in Cape Town where sharp levels of inequality leave many communities living in informal dwellings without access to such amenities (Ziervogel, 2019).

[2] The term 'managing authority' refers to the institutional power responsible for management and ensuring sufficient supply of resources. In this thesis, the managing authority is the City of Cape Town, it's Water and Sanitation department and the prominent individuals involved in decision-making. It is important to note that this framing implies a position of power for management; this is not a supposition of the author, but rather a reflection of the systems in which the City of Cape Town operates.

[3] The crisis was commonly referred to as 'the drought', however the crisis was not only hydrogeological and as such this project uses the term 'water crisis' instead, to acknowledge the broader complex social and political aspects, beyond the result of low measures of rainfall.

[4] Communication items for this study included speeches, public statements, summaries, photographs, presentations, posters, pamphlets, information guides, infographics and a newsletter. It did not include items such as budgets, reports, punitive measures, strategies, policies and by-laws. For further details on sampling criteria see section 4.3 sapling (pg. 27) and section 4.5 Limitations and challenges (pg. 31).

Consider the recent Cape Town water crisis. In November 2017, the City of Cape Town (CCT or the City) announced that without drastic water consumption reduction, water users, including residents and businesses, of Cape Town would face Day Zero in a matter of months. Cape Town and the Western Cape province had experienced consecutive dry winters between 2015 and 2017, which failed to provide enough rainfall to replenish supply dams and caused a drought (Ziervogel, 2019). The drought became a water shortage crisis when authorities could not ensure regular supply levels before the next rainy season. Day Zero signified the moment when the dam levels would drop below 13,5%, public supply would be cut off and people would have to collect a daily ration of 25 litres from one of 200 specified water points (City of Cape Town, 2017ao). As the municipal government for Cape Town, the City[5] implemented restrictions, revised water tariffs and launched a city-wide campaign to encourage water conservation behaviour. The CCT's water crisis (03/2017 – 03/2018[6]) response campaign was a reactive response to the water crisis that hinged on the threat of Day Zero actualising, and the need for public cooperation during the crisis. The City issued a flood of information in the form of communications to residents and used multiple platforms and mechanisms to communicate with the public to avoid Day Zero becoming a reality.[7] Additionally, other interested parties also launched campaigns regarding the water crisis and how to reduce water consumption. As a result of these efforts there was a significant drop in demand across Cape Town and the City was able to delay Day Zero until adequate rainfall in the winter of 2018 replenished supply dams and deferred Day Zero beyond 2019.

The collective efforts to conserve water were successful in that they achieved the broader goal of deferring – and ultimately avoiding – Day Zero by engaging and influencing the public to participate (Robins, 2019). However, the crisis brought about new public awareness regarding water and with this came contesting views. Oftentimes, the functional efficiency of infrastructure management appears mundane; it is framed in a way that conceals its functioning until a malfunction of some kind causes a disturbance in that efficiency, revealing the operations and functioning behind said infrastructure (Robins, 2019). Experience over time influences the expectations associated with water access and how a drought is then perceived as a deviation from normal experience and expectations[8] (Hurlbert & Gupta, 2016). The Cape Town water crisis illustrates how the water shortage caused a breakdown in the CCT's business-as-usual operation and

[5] The City of Cape Town is referred to as the 'CCT' or 'the City' throughout the thesis.

[6] These dates are based on when Cape Town was declared a local disaster area (3/3/2017), and when the crisis (i.e. Day Zero) was announced to be officially deferred to 2019 or beyond (19/3/2017) (Ziervogel, 2019).

[7] While the City may have released many types of communications through many platforms, it does not necessarily mean that the communications reached or were received by all residents.

[8] Despite the unpredictability of ecosystems and natural phenomena due to natural variability and human interference, many people perceive a water shortage as an anomaly due to their customary convenient access (Hurlbert & Gupta, 2016).

prompted multiple stakeholders to reconsider, reframe and redefine their understanding of and relationship with water. Studying the crisis offers insight into prominent perspectives within the City, and how agency, responsibility and risk were framed in relation to the situation at the time, as well as how the City's framing of the drought shifted over this period.

1.2 The study

In light of the crisis, this research project analyses the way the City framed the water crisis in a subset of their official communication items to the public during the recent water shortage in order to contribute to understanding the role of public communications by city municipalities in water crisis management. In order to achieve this aim, the following objectives have been set to guide the research process:

1. To determine the types and characteristics of communication items released by the City of Cape Town during the recent water crisis.
2. To determine a range of frames employed by the CCT in communicating the drought.
3. To analyse trends in the framing of the water crisis messages, and to identify if there were shifts in framing and messaging throughout the water crisis response period.

The research draws on literature on water crisis management and framing theory to develop a coding scheme in order to analyse the types of frames that are present in the CCT's communications (Laws & Rein, 2003; Dolnicar et al., 2012; Wilhite et al., 2014; Kohl & Knox, 2016). While there are examples of literature which examine the importance of message framing in drought management or environmental management (Hurlbert & Gupta, 2016; Turner et al., 2016; Buurman, Mens & Dahm, 2017; Liang et al., 2018), there is no example that has been found which creates a coding scheme to analyse the framing of a drought or water crisis in communications released by the water managing authority. Analysing the CCT's water crisis response communications uncovers trends and/or shifts inherent in the Cape Town water crisis.

Knowledge, communication and behaviour are closely linked, and understanding how a problem or solution is framed is an important factor in influencing public perceptions and reactions (Dziegielewski, 1991; Liang et al., 2018). Key to this study are items of communication which dispatch information to the public in the form of posters, leaflets, television advertisements, social media as well as press releases and other official announcements, all of which aim to inform and encourage the audience – in this case the residents of Cape Town – to take action to reach objectives set by the managing authority. Central to these communications is framing, a process where the thinking and perceptions on a particular matter are developed and orientated, or reoriented, from a particular viewpoint (Chong & Druckman, 2007). Frames can function unconsciously

or be strategically created, and though often overlooked, are ubiquitous, providing shape and stability for understanding phenomena (Laws & Rein, 2003). Understanding the way the City of Cape Town framed the problem of, solutions to, and responsibility for the Cape Town water crisis in the communication items released to the public can point to contesting interpretations, dominating perspectives, conflated messages and associated challenges in governing and managing water during a crisis. This study adopts a qualitative approach and therefore does not seek to generalise about effective framing of water crises as each water crisis is subject to unique circumstances and localised experiences, and will be framed in a particular, context-specific manner. Nevertheless, the project will produce a scheme of drought and water crisis framing types which could be useful for analysing other cases of drought.

1.3 Wider significance

Water is a vital necessity for any human settlement. Goal number 6 of the Sustainable Development Goals [SDGs] is to secure access and availability as well as ensure sustainable management of water for all (United Nations Development Programme [UNDP], 2018). This demonstrates the importance of water management on the global agenda. It is also reflected in Section 27 of the Constitution of South Africa, which asserts that everyone has the right to sufficient water (South African Government, 2017). Over the last 100 years, developed parts of the world have become accustomed to effortless access to water while in many other parts of the world, water supply is threatened or unstable. Water contamination and pollution, diverted water courses, weather variation, climate change, metropolitan densification and growing populations with water demands that exceed supply capacity are some of the main factors contributing to water scarcity (UNESCO, 2018). It is therefore necessary for managing authorities to manage not only the quality and quantity of this vital resource and its associated infrastructure, but to also manage demand, particularly amongst communities who have wasteful or excessive consumption habits. This is especially important in times when a diminished or inadequate water supply threatens life, and when communicating a water crisis in order to influence a reduction in consumption can be the primary short-term mechanism for avoiding a full blown crisis, as has been seen with the Cape Town water shortage.

Increasingly, water is recognised as one of the most valuable finite resources on the planet with roughly only 1,3% accessible for potable consumption (IAEA, 2011).[9] Given the growing population of humankind, the projections for climate change and the consequential stress on water resources, it is important to understand how communicating water-related information works to guide behaviour at local and mass scales. While many cities seem to have some sort of tactical planning in place for drought, measures tend

[9] The remainder of earth's freshwater is contained in groundwater systems (30,1%) and permanent frozen ice (68,6%) (IAEA, 2011).

to only be implemented during times of emergency (Buurman, Mens & Dahm, 2017). In Cape Town, the crisis reached a point where the CCT resorted to urging the public to make major adjustments to their water consumption behaviour in order to avert a full-blown crisis i.e. reaching Day Zero. The City urged the public to participate collectively in these efforts. Some reported the Day Zero crisis as the 'great leveller' bringing disparate income levels in Cape Town closer as they faced the same plight (Robins, 2019).[10] However, a breakdown or crisis such as the threat of Day Zero brings to the surface new and competing understandings and framings of water and the associated rights and handling of the resource (Robins, 2019).

This project examines the role and types of frames in the communications that were released during the water crisis. The Cape Town water crisis and the City's subsequent response campaign is the chosen case study because of the urgency, relevance and ubiquity it had not only locally, but also internationally. Furthermore, given the projections of increased climate risk and changes in weather patterns, water management policy and water crisis response plans are increasingly recognised as useful and important devices to guide actions when such events arise. The hope is that this research can contribute in some way to improve crisis response and water management.

1.4 Structure of thesis

The thesis consists of seven chapters. Chapter 1, *Introduction*, introduced the study, provided background, and outlines the importance of work in this field for more effective crisis management. Chapter 2 presents the *Theoretical framework*, which introduces literature and theory relevant to the project. Chapter 3 offers *Context*, by briefly describing the background of the study, the drought, and the subsequent water crisis in Cape Town, and situates the study area by including factors such as geography, hydrology, and water management in Cape Town. Chapter 4 describes the *Research methods*, by providing a breakdown of details about data collection, sampling, data analysis and limitations. Chapter 5, *The framing of drought crisis communications by the CCT*, presents the analysis and findings of the study. Chapter 6 consists of the project's *Discussion*, which interrogates the findings of the study, identifies trends and shifts and delves into the relevance of the findings. Finally, chapter 7 is the *Conclusion*, which summarises the background and lead up to the Cape Town water crisis, the project undertaken, the findings of the study and answers to the aim and objectives of the study. It also reiterates the wider relevance of the study and notes areas for further study.

[10] While some may have seen the crisis as something that unified the disparate society of Cape Town, it is important to note that living with water scarcity is not a new reality for many people in South Africa (and worldwide) who rely on public taps to collect water, a task limited to transport capacity and subject to interruptions in water supply (Ziervogel, 2019).

Chapter 2
Theoretical framework

2.1 Introduction

This research project analyses the way the CCT framed the water crisis to the public in their official communications made available online during the recent water shortage in order to contribute to understanding the role of public communications from urban municipalities in water crisis management. In order to achieve this aim, a combination of theories and concepts from different disciplines are utilised. The project draws on water crisis management literature and framing theory, developed in the disciplines of environmental governance and sociology respectively, as the primary bodies of literature. The literature drawn upon also overlaps with urban water management literature at the scale of day-to-day operations, as well as water risk management literature at the macro, long-term scale. Water crisis management literature is used to situate the Cape Town water crisis within wider international drought management research. In particular, it looks at water conservation campaigns and how managing authorities communicate the status of a crisis, and selected responses and recommend solutions to the public. Human beings rely on communication to organise interactions and activities, and framing theory is useful to gain insights about the subliminal as well as overt messaging inherent in communications (Dziegielewski, 1991; Hurlbert & Gupta, 2016; Buurman, Mens & Dahm, 2017). Additionally, framing theory informs the methodological approach of the study. While framing literature encompasses a broad body of work, this project sought out framing literature that was applicable to water crisis management and public communications. The project also draws on literature regarding climate change and water risk management as occurrences of environmental crises are expected to increase with anthropocentric climate change. It is therefore useful to reflect on past experiences in order to minimise future risk in water management and to plan for future resilience.[11]

This chapter consists of two main sections. Section 2.2 presents the theory of framing and framing studies. This is followed by section 2.3, which introduces literature on urban water management and water crisis management, after which the chapter's conclusion follows.

[11] The study was conducted between October 2018 and November 2019. It is recognised that several studies on the Cape Town drought have subsequently been published, however, these are not included as they were not available during the study period.

2.2 The concept of framing

This study draws on the theory of framing as the primary theoretical framework. Framing theory proposes that any given matter, situation or phenomena is subject to multiple interpretations; underpinning these perspectives are underlying frames which organise information according to particular rules of logic – i.e. frames – and facilitate a process of understanding (Ardèvol-Abreu, 2015). This is particularly relevant in communications and messaging where the way in which an issue is presented – or framed – affects how viewers make meaning of it. The concept of framing first appeared in the 1950s but gained traction in the 1970s after Erving Goffman (1974) published *Frame analysis: An essay on the organization of experience* exploring the concept's application in sociology. Goffman's work expanded framing beyond individual processes of interpretation to collective schema that shaped shared interpretations of reality, which was particularly useful for explaining social phenomena. In the 1980s, framing research focused on sociological applications and analysing communications; while the following decade (1990s) the research began to focus more on media studies and media discourse (Ardèvol-Abreu, 2015).

According to the theory, humans are compelled to make meaning of information and their experiences by applying patterns of logic or 'frames' which help to interpret phenomena (Laws & Rein, 2003). Frames are utilised in order to apply a logical structure to process and interpret information. 'Frames' refer to the underlying, schematic base for understanding phenomena, while 'framing' refers to the way in which knowledge is represented using interpretive schema which gives order, structure and a dictated understanding to otherwise unorganised elements (Laws & Rein, 2003). Frames prioritise some aspects of reality while overlooking others (Ardèvol-Abreu, 2015). Framing is assumed to be an everyday experience and since frames are socially constructed, they are subject to fluctuation and reorientation (Kohl & Knox, 2016). Framing affects thinking, and thinking is naturally tied to action and practice. Framing can limit the perception on a given matter, which is reinforced, altered or rejected through reflexive thinking. A frame is accepted when it is understood (i.e. the knowledge is easily accessed and assimilated and it does not present doubt in the mind of the holder) and when there is a sense of security that lived experience is not at risk in any way according to the frame (Laws & Rein, 2003). Ironically, despite the presence of frames in all modes of communication and information processing, frames are often implicit, presumed to be obvious or objective, and therefore go unnoticed and do not get much consideration.

Goffman's (1974) concept of framing lends itself well to studies of news media and communications because it helps to explain how communications are able to provide interpretations of current issues and make explicit the underlying assumptions of agendas, be they intentional or incidental. In the exchange of information, frames are present in both the message being sent and the mind of the receiver; these are

distinguished as media frames and audience frames respectively (Ardèvol-Abreu, 2015). The filtering process is subjective, and frames are generally experienced as a natural, implicit aspect of making sense of experiences and information. However, the ubiquity of frames is also central to the construction and exertion of power between management and public.

The study of frames is an approach which aims to reveal insights about trends and changes related to the dominant ideas framing a particular event or matter, and the extent of the influence of the chosen framing by the party responsible for the messaging (Chong & Druckman, 2007). Studies of frames seek to make explicit the underlying frames of a particular event or issue. Frames hold particular relevance for the transmission of written information as well as persuasive mass-messaging (Ardèvol-Abreu, 2015). Such insights may help to understand the underlying dynamics and motives of governments; it also helps to explain why certain courses of action are chosen by management and why events may have played out as they did. Furthermore, the study of frames is useful for understanding power dynamics and how actors in management control narratives, position people, and construct the meaning of situations (Entman, 2007).

There is no single method for approaching a frames study as each case is subject to unique conditions (Chong & Druckman, 2007). As a result there have been a range of approaches taken at the discretion of researchers; this heterogeneity of approaches is considered a weakness by some and necessary by others who believe the naturally complex range of phenomena is only possible to study through a diversity of approaches (Ardèvol-Abreu, 2015). Studies are therefore generally tailored to the matter under investigation and adjusted according to the intended objectives of the study, such as whether the aim is to capture general trends in framing, comparisons or specific details. Some of the key characteristics of frames studies include identifying an issue and the multiple understandings associated with the issue, as frames can only be applied and analysed in relation to a particular event, matter or issue (Chong & Druckman, 2007).

Studies can involve selecting data sources and sampling criteria, and developing a coding scheme with relevant frames for analysing data (Chong & Druckman, 2007). Developing a coding scheme can be done inductively or deductively; either by isolating frames from the analysed content itself, or by consulting similar studies and wider literature and applying theoretical concepts deductively (Chong & Druckman, 2007).[12] It is important to have clear details about how the content will be analysed, considering computer

[12] Creating a list of words and phrases relevant to each frame is a viable action.

programmes or manual options[13] (Chong & Druckman, 2007). Once the aforementioned details have been decided upon, and content has been collected, the analysis and coding process can commence.

2.3 Relevance of framing theory to the research question

The Cape Town water crisis elicited a multiplicity of responses from the public, providing evidence that the same crisis can be understood and experienced from many different perspectives, and a managing authority must navigate this. In this way the drought problem, solutions, and responsibilities are subject to different framings. Drought is not a wholly scientific and value-neutral phenomenon; on the contrary, it can be utilised to assert political goals through the production and circulation of knowledge framed in relation to those goals (Kohl & Knox, 2016). Framing processes are inherent in policymaking and transmitting information that is integral for managing vital resources and therefore holds particular relevance for water crisis management and drought studies.

Water management is inherently both scientific and political; a matter further complexified by the fact that understandings of crises tend to be formed during times of heightened anxiety, when access to water is threatened or absent (Kohl & Knox, 2016). Environmental crises, climate change and the varying associated phenomena such as drought, are often framed in scientific, objective and technical language, despite the influence of subjective values, politics and other various agendas (Kohl & Knox, 2016). While this is not implicitly a negative thing, the role of framing is worth considering when thinking about discourse and power dynamics between a government and it's public.

According to Hurlbert and Gupta (2016), adaptive governance must consider effective modes of framing climate change and the risks associated therewith in order to facilitate public openness to adaptation.[14] Via framing, an issue is defined in a particular manner and a set course of action is presented accordingly, which impacts perceived risks amongst the public (Laws & Rein, 2003). Policy makers often frame an issue as an external, scientific, 'natural' occurrence, which shifts responsibility away from (or makes it disappear entirely from) the resource management authority/government or their role in managing the resource and associated infrastructure (Kohl & Knox, 2016).[15] Vogel and Olivier (2018) suggest that perceptions and expressions of drought within a singular frame instead of a process defined by multiple factors and

[13] Manual coding may require more effort on the part of the researcher, however it also facilitates more flexibly which allows for the discovery of new or more nuanced frames that may not have been identified in the initial frame identification process. It is especially useful for qualitative studies.

[14] Droughts and floods related to climate change are particularly important given the high levels of risk and unpredictability associated therewith (Hurlbert & Gupta, 2016).

[15] Additionally, objective-type framing also serves to distract from climate change occurring as a result of anthropocentric drivers associated with industry and economics (Hurlbert & Gupta, 2016).

occurring over an extended period of time can limit drought responses with regards to who is affected and how they are affected.

The framing of a drought and the suggested solutions put forward by management imply a great deal about the position and outlook of said managing authority. Historically, drought in South Africa has been frequently viewed as a threat to rural, commercial, 'white' agricultural farmers and the framing that dominates drought is scientific, objective, enduring and undoubtedly correct (Vogel & Olivier, 2018). This is an example of a 'strong frame', which has a compelling factor that resonates highly with leaders and the public (Chong & Druckman, 2007). This does not necessarily imply moral or intellectual strength of the frame; oftentimes exaggeration, fear-provocation and use of high-resonating symbols or ideologies are present in strong frames. Nonetheless strong frames do have persuasive force (Ardèvol-Abreu, 2015). The traditional political, technical, 'hard-science' approach to drought tends to overlook crucial nuances, focusing on market-based, supply-side responses, and less on the national management-side orientation, causing many stakeholders to be overlooked (Vogel & Olivier, 2018). This kind of 'episodic framing' occurs when focus is placed on a singular aspect of an issue (Crow & Lawler, 2016).[16] This is perhaps why the Day Zero experience was so contentious, because "even though reality is multidimensional and complex, all our institutional organisations are oriented towards unidirectional and unidimensional interventions, leading to dilemma" (Neto, 2016:32).

While it may be true that a unidirectional and narrow framing may fail to consider other important factors, the opposite but equally problematic predicament is that when an issue is framed in multiple ways, it can lead to fragmentation in policy and management (Hurlbert & Gupta, 2016). While climate change and related phenomena such as drought are widely regarded as scientific fact, the increasing risks associated therewith are less agreed upon, resulting in gaps in knowledge as well as slow and reluctant adaptation measures. Known as 'frame pluralism', instances where multiple frames coexist can hinder agreement and make responsive action near impossible (Laws & Rein, 2003). However, frames are subject to change when the definition of a problem or social factors change, or when a breakdown leads to uncertainty in a given frame (Laws & Rein, 2003). Such a breakdown leads to an opening in perception with which the human mind works to restore order through reframing. When there is persistent unease in the status quo, either due to inherent uncertainty or due to continuous disturbance by involved stakeholders, it prompts cycles of redefinition and reframing (Laws & Rein, 2003). 'Reframing' is not a process that can be strategically

[16] Opposite to 'episodic framing' is 'thematic framing' which incorporates broader, situational aspects into the framing discourse on an issue (Crow & Lawler, 2016).

planned out; it tends to be organic and is oftentimes only recognisable in hindsight, growing out of an enduring series of problems of contestation, discontent and uncertainty (Laws & Rein, 2003).[17]

According to Neto (2016) revising or redeveloping water policy is a necessary starting point in order to move away from the technical-response trend, in order to include more complex or nuanced factors and impacts. Vogel and Olivier (2018) discuss how the drought of the 1990s in South Africa led to the formation of a national Drought Forum which was an inclusive structure with the intention of bringing multiple stakeholders and experts together to develop a strategy for drought governance and risk reduction for the diverse range of people affected by drought. While this transdisciplinary forum is considered to have had an instrumental and effective role in the drought then, over time it was dissolved as the drought subsided. It was, after all, put in place as a response to a crisis and was therefore treated as temporary. This is unfortunate as it leaves the predominant approach to drought crises susceptible to shifting back to a narrower framing (Vogel & Olivier, 2018).

Essentially, the theory of framing suggests that phenomena are presented through a particular lens to promote a particular position. Framing affects how information is interpreted to make sense of experiences. It can influence an audience regarding what to think, how to think and by extension, how to act in relation to a particular issue. In this way, the process of framing is inherent in the formation and publication of public communications. Framing can be viewed both positively or negatively, it can be manipulative and deceiving, or it can be viewed in more neutral terms where it can prompt a learning process whereby common beliefs and social norms are acquired (Chong & Druckman, 2007). When it comes to sustainable resource management, it is necessary for governments to be aware of how they interpret and present their messages, how they position themselves and the public, and how they frame situations, solutions and responsibility. There is a need to communicate with the public in a way that not only informs but also supports responsible behaviour amongst citizens as a central aspect of sustainable resource management. While urban water crisis management is not a reliable long-term solution especially given the likelihood of changing weather trends due to climate change, reactive emergency responses to drought in times of crisis have proven to be effective short-term solutions to water shortage in many parts of the world (Buurman, Mens & Dahm, 2017). Frames studies are important because they shed light on seemingly neutral information, which can have underlying agendas and influence. They offer insight into past experiences including failures and successes, which may be helpful to improve future responses and climate resilience.

[17] In addition to 'reframing', opinions can be swayed by small changes in the way an issue is framed and presented; known as 'framing effects', seemingly minor alterations in the presentation of an issue or an event are able to produce major changes in opinion (Chong & Druckman, 2007).

2.4 Urban water management

Before delving into water crisis management, it is necessary to understand water management generally. According to the system in place for the CCT (and many other urban metropolitan areas around the world), water as a resource is provided to residents by the City as the managing authority (Ziervogel, 2019). The public take a largely passive, consumer role, and it is the responsibility of the City to ensure water quality and access for the public. Urban water management is an integral component of this system; it refers to the decisions, actions and strategies regarding access, quality and quantity of water by a municipality taking into account the needs and perspectives of all stakeholders and users within a municipal area (Neto, 2016). In South Africa, there is a strong focus on ensuring water access for all citizens, which is reflected in policy with tariffs that aim to be as cheap as possible to ensure access for poorer households (Neto, 2016). According to Neto (2016), investigating the relationship between water, consumers and managing authorities, helps to better understand the social, political and biophysical dynamics. It also offers potential for improved relations between the public and government, and better resource management generally.

Figure 2.1 demonstrates the triadic relationship between resource (water), consumer (private households and individual residents)[18] and managing authority (CCT). Through informational communications, tariff increases, punitive measures and incentive programmes the resource managing authority can influence the consumption demand of consumers (Turner et al., 2016). These relations can be strategically managed through communication of information and coercive messaging. However, the resource availability is not fixed; the situation is always shifting and as such, communications management needs to adapt and innovate accordingly (Hurlbert & Gupta, 2016). This suggests that information and communications, such as the City's water crisis response campaign, are an ongoing and critical component of urban water management.

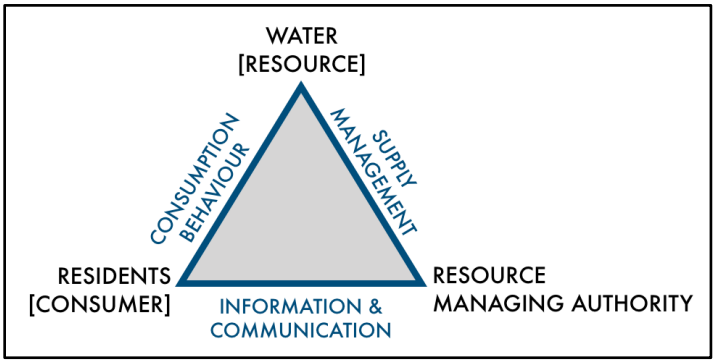

Figure 2.1: Diagram illustrating the triadic relationships between resource, consumer and water management (source: author)

[18] This study focuses on private households and individual resident consumers; however, it is important to note that there are other categories of consumers within the city such as commercial and industrial businesses, public entities and public institutions (such as hospitals).

2.5 Water crisis management

A crisis is defined as a situation presenting difficult and or potentially dangerous circumstances (Naik, 2017). Usually, a crisis occurs when an extreme situation is being recognised and there is a breaking point which signifies a moment of change from usual conditions. Water crises includes drought, floods, infrastructural damage and changes in the physical accessibility of water which threatens daily life. Generally, a water crisis develops when there is a deviation from normal water cycle conditions,[19] causing a breakdown in the government's ability to ensure sufficient access to safe water for the public. Since this project focuses on a water shortage in Cape Town, it draws on drought management literature in particular. A drought is a period of time with pronounced spells of less than average rainfall for a certain area (Head, 2014). A drought becomes a water shortage crisis when it threatens daily human functioning and when it becomes necessary for the water management body to implement intervention measures (Naik, 2017).

Water crisis management refers to the responses, solutions and recommendations put forward by a water management authority in attempts to minimise negative impacts during a water crisis (Head, 2014). Despite the threat of water crises around the world, drought management is largely reactive, symptom-orientated and crisis-centred (Wilhite et al., 2014). Water shortage management solutions and responses, on the other hand, include both long-term and short-term solutions, with demand-side or supply-side objectives. Efforts might include technical solutions such as desalination, wastewater treatment schemes, and constructing new dams (Head, 2014; Buurman et al., 2017). However, technical responses tend to be expensive and require months if not years to develop and implement. In times of acute and urgent shortage, it can be more cost-effective to catalyse demand-side management options such as implementing restrictions, increasing tariffs, reducing pressure in supply pipes and investing in information sharing in order to communicate the crisis with the public and encourage consumption reduction (Turner et al., 2016).

Water restrictions can be an effective short-term solution to balance the supply and demand of water in times of acute water shortage (Dolnicar et al., 2012). Nevertheless, policy and planning for drought preparedness and mitigation is necessary for future resilience. While many parts of the world have been affected in some way by drought in the last two decades, a recent drought in Australia is particularly interesting in that it has many similarities to the Cape Town drought. In what became known as the Millennium drought, Australia experienced a persistent drought between 1997 and 2012 which affected most of the country. In 2008, the government introduced the Target 140 [T140] and Target 155 [T155]

[19] However, other management issues including infrastructural deficits and financial mismanagement may exacerbate or be conflated with an anomaly in water conditions to cause a water crisis.

campaigns in Queensland and Melbourne respectively. Much like the Day Zero campaign, T140 and T155 aimed to encourage residents to limit their water consumption to 140 litres (Queensland) and 155 litres (Melbourne) per person per day (Turner et al., 2016). While the government invested in supply options, demand-side measures were found to be more effective and required less input as well as less resources than supply options (Turner et al., 2016).

There is not much mention in research about what was unsuccessful in the Millennium drought response, rather the focus is on the successful aspects of the campaign. One factor associated with the success of the T140 and T155 campaigns, and suggested for other water saving campaigns, is to consider supply-side as well as demand-side management measures (Turner et al., 2016). Strong demand-side communication programmes that target different levels and sectors of water users (including individual, household, business and industry) and supply-side options that are innovative, diverse and scalable are recommended (Turner et al., 2016). Implementing innovative pricing mechanisms are necessary as they not only work to encourage water saving but also to generate revenue for the supply-side infrastructure development (Turner et al., 2016). In Australia, water prices were increased during the drought and an additional 5% 'environmental levy' was charged to water users (Grant et al., 2013). The price increase highlighted the severity of the situation, discouraged wastefulness and helped to cover the expenses of installing augmentation infrastructure.

Another important aspect put forward for drought management is to have open and understandable communication between the governing body and the public about the state of the drought and the response measures being utilised; reliable data and ongoing monitoring methods are necessary to ensure open and relevant communications (Turner et al., 2016). In Australia, municipal authorities implemented communication strategies in attempt to bring down consumption levels, with dedicated mail deliveries, informative websites and media advertising (Turner et al., 2016). Residents were strongly encouraged to adhere to a voluntary target of 150 litres total water use per person per day. Residents were urged to take short showers (no longer than three minutes), and to collect rainwater and grey water for flushing and irrigation. Authorities also introduced WaterMAP as a means to manage major water users by requiring mandatory annual reports and in-house water conservation plans (Grant et al., 2013). Water authorities also assisted commercial and industrial water users to develop water reduction plans (Grant et al., 2013). In addition, targets were set by water management; the state of Victoria set a target to reuse 20% of all wastewater inflows to be harvested and directed to treatment plants. This target was exceeded (24% in 2010) but was only possible when coupled with responsible regulations regarding water quality and careful

management on a continuous basis (Grant et al., 2013). Overall, the focus was on education, behaviour change and valuing water as a collective good rather than pushing punitive measures (Turner et al., 2016).

2.6 Demand-side urban water management and public communications

The need to communicate with the public in order to facilitate water reduction behaviour changes has proven to be highly useful for managing a water shortage effectively. According to Dziegielewski, (1991) a successful campaign includes a message conveying the seriousness of the drought and the effects likely to occur without behaviour change. It also has a social reinforcement element that encourages conservation-behaviour amongst community groups and a confirmation of how consumers reduction efforts will help in mitigating the water shortage (Dziegielewski, 1991). This includes carefully determined and reasonable requested changes that are conceivable and achievable for consumers, and offer a sense that the requested efforts are fair and necessary (Dziegielewski, 1991). Lastly, incentive strategies and feedback opportunities are suggested for residents to see the results of their efforts (Dziegielewski, 1991).

The factors mentioned above were all incorporated into the T140 and T155 campaign in some form. The communications campaigns composed of mass media messages and imagery in the form of posters, information booklets and fact sheets, a website for information, and direct mail delivery of fridge magnets and four-minute shower timers (Turner et al., 2016). Information regarding water storage levels, weekly rainfall and suggested water saving methods were regularly communicated to residents on all major broadcasting platforms including television, radio, newspapers and billboards (Grant et al., 2013).

While Dziegielewski's (1991) suggestions are important, campaigns normally consist of multiple strategies and these strategies do not function in isolation but work in various combinations in reaching an audience (Liang et al., 2018). This is to say that the role of framing for effective water conservation campaigns and water crisis management generally is not a simple equation. However, it is worth noting that messages based on loss are heavily utilised in times of crisis. Liang et al., (2018) found that when people perceive a situation as having high risks, they are more accepting of and willing to adopt alternative water consumption behaviours. Messages based on potential losses are more effective than messages about potential gains as losses seem to evoke stronger responses than gain messages (Liang et al., 2018). It is also worth noting that increased awareness of perceived risk (usually via first-hand experience) can lead to critical pro-environmental behaviour changes. This was observed in an area experiencing drought in the state of California, USA, where an overall target of 25% water demand reduction was set with different targets for each water district (Palazo et al., 2019). Research found that the more severe the drought was in a particular area, the more likely that area was to achieve the set goal (Palazo et al., 2019). This confirms the notion

that communications campaigns play an important role in delivering vital information to residents who are required to reduce their demand in order to minimise the severity of the water shortage.

2.7 Conclusion

The first part of this chapter looked at framing theory, which asserts that there are multiple ways to view and understand an issue; known as frames, these viewpoints determine how types of information and events are presented and perceived. Framing theory is particularly relevant to media and communications studies, where the framing of phenomena affects the interpretation thereof. Furthermore, framing not only affects how a situation is perceived, but also what course of action is taken in response. Therefore, frames studies can be useful to offer insights into dominant frames, shifts over time and different trends of framing by different groups on the same issue.

The second part of this chapter looked at urban water management, which essentially deals with the triadic relationship between management authorities, the public as consumers and water as a resource, and includes all decisions, actions and strategies taken by water management authorities to handle access, quality and quantity of water to the public. Communication is a critical component of resource management as it helps to deliver messages, recommendations and any restrictions to the public. This is particularly pertinent during times of heightened risk, as is the case when a water shortage becomes a water crisis because it escalates to pose potential danger to society. Water crisis management refers to the measures put in place by the management authority to reduce the risk of negative impacts, and may include short-term or long-term methods targeting a reduction in consumption levels, technical solutions and other measures that could offer relief. Once again, communications is an effective mechanism for managing a water crisis and studying its role in urban water management offers potential to identify effective methods and improve overall management.

The recommendations from research on recent water crises, such as the Millennium drought in Australia, indicate the importance of studying real life examples of drought framing for improving future responses and planning by governments around the world. The CCT's water crisis response campaign aimed to drastically reduce water consumption levels amongst residents of Cape Town when the water supply was uncertain. Analysing communication campaigns such as the City's water crisis response, may offer insight into the potential of communications to improve resource management overall. Hence the concept of framing is selected here as a theoretical framework that can detect underpinning understandings in drought communication messages. This is especially pertinent given the increased likelihood of variating weather conditions and extreme, life-threatening weather events.

Chapter 3

Context

3.1 Introduction

This chapter provides a brief overview of the context of Cape Town's water crisis between March 2017 and March 2018 and the crisis-response actions undertaken by the City. It covers Cape Town's geography, economy, population, range of water users, climate, hydrological state and water storage system. The City of Cape Town's municipal region and approach to water management is also discussed as well as the lead up to the water crisis.[20] The full story is dense and complex and has therefore been summarised here. The chapter provides the contextual factors that provide a background to understand the Cape Town water crisis.

The chapter begins by covering some of the broader factors relating to Cape Town and water in section 3.2, including the climate, hydrology and geography of the Cape Town region. It then moves on to section 3.3 which deals with water management in the City of Cape Town. Section 3.4 focuses on the events in the lead up to the crisis and the progression from drought to water crisis in Cape Town. Section 3.5 discusses other actors besides the City, and section 3.6 concludes the chapter.

3.2 Climate, hydrology and geography of Cape Town

Known for its natural beauty, Cape Town is a metropolitan city situated at the south western peninsula of Africa. The city is a popular tourist destination as well as one of South Africa's regional capital cities and economic hubs with a busy shipping port (Ziervogel, 2019). The City of Cape Town is the municipal body responsible for 2 446.4 square kilometres of the Western Cape region [see figure 3.1] (Municipalities of South Africa, 2019). The estimated population for Cape Town is 4 005 015 people; of which 17,6% are reported as living in informal housing without built-in water infrastructure (Wazimap, 2019). Residents in formal housing consume an estimated 66% of water while informal settlements consume as little as 4% of the water supplied by the CCT (Ziervogel, 2019).

[20] For a comprehensive overview see Gina Ziervogel's *Unpacking the Cape Town Drought: Lessons Learned. Report for Cities Support Programme* (2019).

Figure 3.1: Map of the City of Cape Town's municipal region (Source: Municipalities of South Africa, 2019, https://municipalities.co.za/overview/6/city-of-cape-town-metropolitan-municipality)

The region experiences a Mediterranean climate with warm, dry summer months and cool, wet winter months. The majority of rainfall occurs during the winter season between May and October (Wolski, 2018). In the past, the region received an annual average rainfall varying between 400mm in the more arid west coast, and 2 000mm in the mountain regions (Wolski, 2018). In the winters of 2015, 2016 and 2017 rainfall dropped between 30% and 50% below average, causing a hydrological drought in the region (Wolski, 2018).

Cape Town relies on water from supply dams in outlying areas. Known as the Big Six, the Theewaterskloof, Voëlvlei, Berg River, Wemmershoek, Upper Steenbras and Lower Steenbras dams account for over 99% of the total storage of water in the Western Cape Water Supply System [WCWSS] which supplies the City [see figure 3.2] (Ziervogel, 2019; DWS, 2019). The water system has a total capacity of around 900 000 million litres, a number that has been reached frequently in the past; in fact, in the season before the onset

of the drought, 2014, the system reached 100% capacity and the rainy season finished near full with a total of 885 441 million litres in storage (Wolski, 2018; CSAG 2019). However, the WCWSS saw significant drops between 2015 and 2017 as a result of the 'dry' winters, going from an overall total of 655 134 million litres in 2015 to 344 657 million litres in 2017 [see figure 3.3] (CSAG, 2019).[21] The WCWSS supplies not only the City of Cape Town but other municipal and agricultural areas in the region as well (Ziervogel, 2019). Consequently, multiple municipalities were affected by the water shortage in the Western Cape. However, as the user with the highest demand, the CCT had the biggest pressure to respond (DWS, 2019).

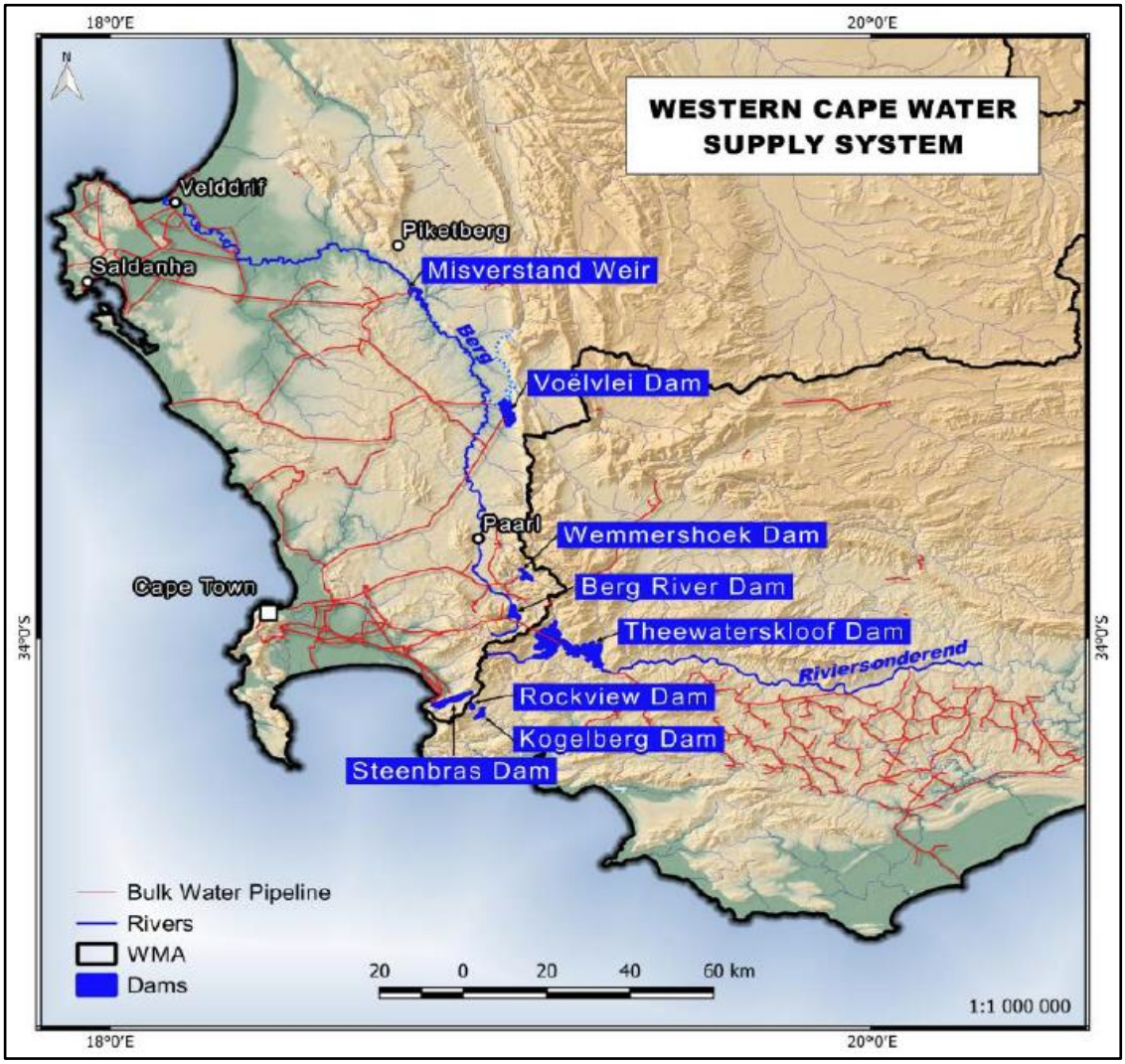

Figure 3.2: Map showing the main supply dams in the Western Cape Water Supply System (source: DWS, 2019, http://www.dwa.gov.za/Projects/RS_WC_WSS/sa.aspx)

[21] Measurements are recorded on November 1st each year, which marks the beginning of the hydrological year and the end of the rainy season, when the dams are technically at their fullest for the year (Ziervogel, 2019).

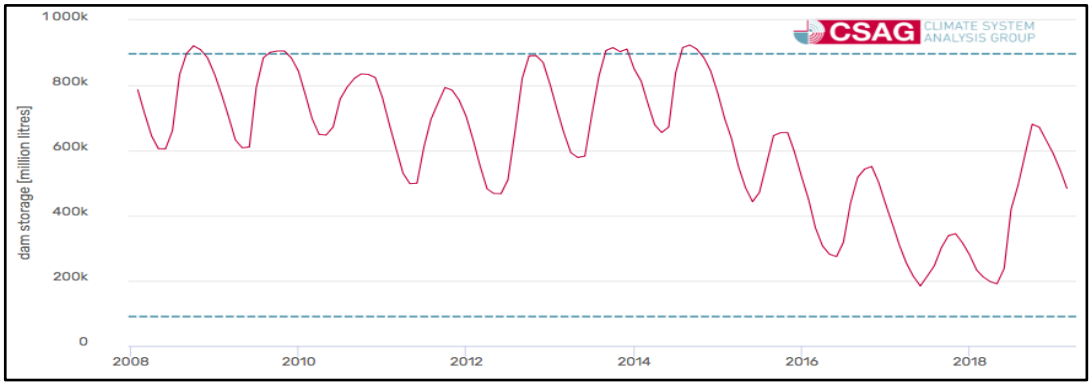

Figure 3.3: Graph showing the dam storage levels for the Western Cape Water Supply System from 2008 to 2019 (source: csag, 2019, http://cip.csag.uct.ac.za/monitoring/bigsix.html)

3.3 Water management in the City of Cape Town

In South Africa, water is recognised as a common good and is co-managed across different levels of government, with local governments largely responsible for the logistical management of day-to-day supply (City of Cape Town, 2019b). Within the CCT, the Water and Sanitation Department [WSD] is responsible for managing water. The department oversees city supply, catchment management, quality control, meter reading, waste management, stormwater management, pollution prevention, treatment schemes, and augmentation plans (City of Cape Town, 2019b). In addition, the department includes the Water Demand Management and Strategy Branch, which handles demand-side management. Furthermore, the department is involved in the collaborative management of the WCWSS as it is a complex system which requires cooperation between different levels of government and multiple municipalities, with some dams belonging to the CCT and others to the national Department of Water and Sanitation [DWS] (DWS, 2019).

Before the water crisis, the CCT supplied around 900 megalitres of water to city residents and businesses each day (City of Cape Town, 2019b). The WCWSS seemed relatively stable with models indicating the system's supply to be at a level of 98% assurance for urban users and 95% assurance for agriculture for any given year (Ziervogel, 2019). Given the high levels of assurance and the unlikeliness of three years of persistently low rainfall, there were no contingency plans for a crisis of this severity. However, at the first warning signs of a shortage in 2015, Disaster Management within the CCT and the Western Cape Provincial Government (referred to as the Province) conducted assessments. Realising the risks, Province requested that National Disaster Risk Management declare a disaster in the Province (Ziervogel, 2019). However, this request was unmet and the situation treated as not-yet -urgent. It was not until March 3rd, 2017 that Cape

Town was declared a disaster area[22] and noticeable restrictions came into effect for the Cape Town public (Robins, 2019).

In response to the urgency of the water shortage in 2015 and 2016, water-saving measures that were implemented by the City included increased tariffs, reduced water pressure, investment in desalination and groundwater extraction, and incremental levels of stringent restrictions for individuals, households, business and agriculture (Ziervogel, 2018).[23] In addition, the City established the Water Resilience Task Team [WRTT] in May 2017, who were tasked with devising a Water Resilience Plan based on various scenarios with the aim of planning the objectives and logistics of water supply, particularly if the 'new normal' low levels of rainfall were to persist in 2017 (Robins, 2019).

As the crisis peaked in October 2017, the Mayor began daily meetings with various key players in order to monitor the precarious situation. Around this time, communications and demand-management responsibilities were shifted from the internal department in the WSD to a high-level task team chaired by the Mayor (Ziervogel, 2019). This task team included an external communications firm called Resolve, who were involved in the communications released to the public. Informing and encouraging the public to reduce demand was crucial to preserve the small amount of water that was available in the system. With the influence of Resolve, the CCT initiated the Day Zero campaign in the last quarter of 2017. Day Zero was a term that referred to a future date where the taps would be cut off.[24] The campaign aimed to prompt significant reductions in water consumption amongst the residents of Cape Town through multiple communications platforms and utilising a variety of techniques and strategies to communicate the drought severity, restrictions, allowances and suggested reduction measures (Ziervogel, 2019). This task team was the driving force behind the City's drought response campaign. The City's approach has been criticized for being too fear-provoking, however there was a reduction of water consumption making it successful albeit contentious (Robins, 2019). The winter of 2018 brought sufficient rainfall to replenish the supply dams, which lifted the persistent drought, and in March 2018, Day Zero was officially 'delayed' to 2019 or later (Robins, 2019).[25] In October 2018, restrictions were dropped to level 5 and in December further dropped

[22] Following the local disaster announcement, a provincial disaster was declared in the Western Cape Province on May 23rd, 2017; and a national disaster declared only on February 13th, 2018 (Ziervogel, 2019).

[23] More controversial methods included the green dot map and the release of a list of the roads where the highest 100 consumers resided (Robins, 2019; Ziervogel, 2019).

[24] Day Zero is a term that was closely related to the Cape Town drought. It first began being used in early 2017 on electronic message boards along the freeways to communicate to the public the projected days until water supply would cut off (Ziervogel, 2019).

[25] The City states that the Day Zero was averted and the crisis period is over, however there is still the ongoing challenge of access to adequate amounts of quality water and sanitation in Cape Town's 204 informal settlements, many of which have been subjected to Day Zero conditions for years. While the crisis may be over in terms of water

to level 3, offering a sense of relief for the residents of Cape Town (Western Cape Government, 2019). As a result of the crisis, a comprehensive water strategy draft is being developed for the City of Cape Town, should a similar crisis arise in the near future (Ziervogel, 2019).[26] Table 3.1 lists some of the important events leading up to the water crisis.

Table 3.1: Brief timeline of events of the Cape Town water crisis (adapted from Ziervogel, 2019, and CSAG, 2019)

November 2014:	WCWSS closes rainy season with 885 441 million litres in supply
November 2015:	WCWSS closes rainy season with 655 134 million litres in supply
November 2015:	Provincial Disaster Management requests National Disaster Risk Management to declare national disaster status
November 2016:	WCWSS closes rainy season with 550 953 million litres in supply
March 2017:	Cape Town is declared a local disaster area by the Mayor
May 2017:	The term Day Zero begins to be used
June 2017:	Level 4 water restrictions implemented
September 2017:	Level 5 water restrictions implemented
October 2017:	Mayor assembles special task team and daily meetings commence
October 2017:	WCWSS closes rainy season with 344 657 million litres in supply
November 2017:	The term Day Zero is officially adopted for water crisis
January 2018:	Level 6 water restrictions implemented
February 2018:	Drought declared National disaster affecting three provinces
March 2018:	Day Zero is delayed to 2018
May 2018:	Day Zero is delayed beyond 2019
October 2018:	Restrictions drop to Level 5
November 2018:	WCWSS closes rainy season with 671 500 million litres in supply
December 2018:	Restrictions drop to Level 3

available, political ecologists would argue that the urgency with which the 'crisis' was addressed by the City, was reserved for the upper-middle class, which indicates an inequitable view of the poor by the CCT.

[26] According to the draft, future approaches to water crisis include clear communication strategies to communicate to urban residents the worth of water, future climate effects and the importance of planning for extreme weather events (City of Cape Town, 2019a). Existing as well as potentially effective new channels of communication will be explored with the intention of mobilising social media, innovative storytelling and adaptive messaging (City of Cape Town, 2019a).

In 2017, the then Mayor of Cape Town, Patricia De Lille, co-authored a book titled, *View From City Hall: Reflections on governing Cape Town*. The book dealt with the CCT's approach to managing the ever-expanding city and the complexities associated therewith (De Lille & Kesson, 2017). Considering the book was released just prior to the Day Zero crisis period, it has relatively little content related to a water shortage crisis. The authors acknowledged the drought, how it challenged the effectiveness of the City's long-standing water system and suggested the need for future augmentation. De Lille & Kesson, (2017) note the existence of water-conservation and water-demand management plans but do not unpack future planning for drought resilience in detail. Instead the focus is placed on responsible participation from residents. The authors note an apathy and a lack of cooperation of some high-user residents, which they believe hinders the effectiveness of demand-side management (De Lille & Kesson, 2017). According to the perspective of the City at that time, they managed the system well but their responses to drought were limited (De Lille & Kesson, 2017). Public communications was highlighted as a critical aspect of water reduction, along with increased water charges and reduced pressure in the system (De Lille & Kesson, 2017).

3.4 From drought to water crisis

The drought was a natural phenomenon that occurred due to below average rainfall (Wolski, 2018). The matter was exacerbated by three years of back-to-back below average rainfall. The drought became a water shortage crisis when the City recognised that the WCWSS could no longer supply normal demand. Through the operationalisation and implementation of multiple water-saving measures, the City was able to reduce water consumption to supply around 510 megalitres a day – 43% less than before the crisis (City of Cape Town, 2019b). The recent water crisis was the worst in Cape Town's recorded history dating back to the 1880s (Wolski, 2018). While other periods of drought have occurred, the severity of the most recent water crisis is unprecedented and yet despite being unlikely, it did occur, highlighting the need for contingency planning and public engagement.

One of the primary factors involved in the lead up to the crisis was the three consecutive hydrological 'dry' years which did not replenish the supply dams enough to meet the demands of WCWSS users (Wolski, 2018). Another factor was the City's slow response time due to the imperceptible threat in 2015 and 2016 when the WCWSS could still meet demand and the general assumption was that the winter of 2017 would deliver normal average rainfall, which it did not (Wolski, 2018). Despite the fact that Cape Town is an arid region, a water shortage of this severity had never been experienced, so when 2017 proved to be another 'dry' year, it became clear that there was not a contingency plan for such a crisis as it had never been needed before (Ziervogel, 2019). Further factors include the fact that high water users were accustomed to easy access and concerns for moderation were minimal.

3.5 Other actors

Up to this point, this chapter has focused on the scientific facts of the drought and the sequence of events by the City as they attempted to manage the water shortage. While the role of the City is central to this study, the CCT is not an isolated institution and there are other actors worth noting – both state and non-state actors. The Department of Water and Sanitation at national level works with provincial government[27] to manage water (DWS, 2019). Their responsibilities focus on policy formulation and implementation, release of dam water and implementing restrictions where necessary (Ziervogel, 2019). The logistical management of day-to-day water supply is the responsibility of local governments based on national/provincial allowances, hence the active role of the CCT during the water crisis (City of Cape Town, 2019b).

It is also worth noting the existence of minor actors such as residence associations, social coalitions and activist groups, who banded together to form community campaigns in the spirit of the Day Zero crisis and also expressed concerns and criticism regarding the City's management of the situation (Robins, 2019). It is possible that communities were more willing to trust these smaller actor groups, however the extent to which they influenced the public in comparison to the City is not dealt with in this study. Nevertheless, the City was instrumental in setting up the dominant frames of the problem, how it was understood and what solutions were put forward. In this way understanding the backstory of the water crisis in Cape Town in 2017/2018, is to understand how the City exerted its power in rendering the framing of the crisis.

3.6 Conclusion

Cape Town is a large metropolis located in an arid region at the southern tip of Africa, which experienced a highly unlikely hydrological drought between 2015 and 2017. Overall, it is considered that the City underestimated the severity of the water shortage. While they were aware of the drought and the need to prepare for water shortage in future infrastructure planning, it was still considered to be under control. The drought became a water crisis for Cape Town's four million residents when it became clear that the municipality was unable to ensure supply. Amongst other mechanisms and undertakings, the City appealed to the public to reduce consumption in order to minimise the likelihood of reaching Day Zero. The threat of dry taps moved many to action, drastically reducing water demand in the city and delaying the actualisation of Day Zero until rainfall in 2018 replenished supply dams. Going forward, it is likely that climate change and anthropocentric drivers will exacerbate the likelihood of disrupted weather patterns and the occurrence of extreme climate events such as the three-year drought in Cape Town (Otto et al., 2018).

[27] There is no specific department of water in the provincial government of the Western Cape.

While there is a need for better planning and more resilient infrastructure, the reduction in consumption in Cape Town, illustrates how a city can conserve massive amounts of water when it is necessary. It was in this context that the City relied heavily on communications with the public to convey messages about the state of water available, restrictions being implemented, the City's efforts to mitigate the situation, and to make the public aware of the importance of adopting behaviours that are not wasteful.

Chapter 4

Research methods

4.1 Introduction

This project focused on items released to the public and made available online which intended to inform them of the state of the drought and how to save water, as well as to communicate the position of the CCT vis-à-vis the crisis by the executive mayor and the City. Items were collected and sorted and an abductive approach (Dubois & Gadde, 2002, Soiferman, 2010, Eriksson, 2012) was taken to develop a coding mechanism and to analyse data simultaneously. Data was recorded onto excel spreadsheets, which were then used to analyse trends in the City's framing of the water crisis and whether the City's framing shifted throughout the response period.

This chapter is divided into four main sections: data collection, sampling, analysis and limitations of the study. Section 4.2, data collection, consists of details relating to how the data was sourced. Section 4.3 is the sampling section, which explains the criteria for data included in the study. Section 4.4 is the analysis section, which describes how the data was processed and coded, and lastly, section 4.5 is the limitations and challenges section, which notes some of the shortcomings and restrictions of the project.

4.2 Data collection

Data consisted of primary documentary material produced and released by the CCT during the water crisis (03/2017 – 03/2018). Items of data were accessed via the water-related pages from the City's website including the water saving toolkits (https://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources), the water dashboard (https://coct.co/water-dashboard/), ThinkWater (https://coct.co/thinkwater/), and the water and sanitation education resources (https://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/Water-education-resources). Data was comprised of official communications released by the executive mayor and the City in the form of speeches, press releases, public summaries, and educational materials which consisted of items that offered drought information and water-saving instructions to the public in the form of posters, photographs, information guides, infographics and

a newsletter. All items were released by the CCT during the crisis period (03/2017 – 03/2018) and all were made available online.

4.3 Sampling

The data set consisted of items released between March 2017 and March 2018. These temporal bounds were based on the date the mayor declared Cape Town to be a local disaster area (3/3/2017), and the date it was announced that the crisis (i.e. Day Zero) was officially deferred to 2019 or beyond (19/3/2017) (Ziervogel, 2019). The hydrological drought began in 2015, however the disaster status was only declared in March of 2017, and it was not until October of 2017 when Day Zero was announced, that the crisis peaked (Ziervogel, 2019). This peak is reflected in the significant spike in Google hits for the term "Cape Town Drought" as depicted in figure 4.1.

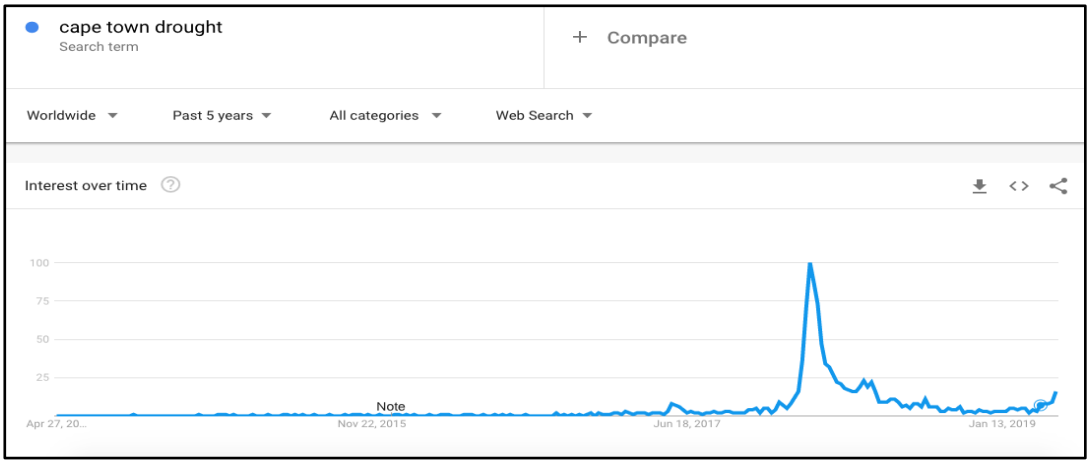

Figure 4.1: Google Trends results for the term "Cape Town drought" between April 2014 and April 2019 (source: Google Trends, 25 April 2019)

This project focused on English communications, as this was the City's primary language of communication during the water crisis. It is worth noting however that the City released multiple versions of some items – particularly educational items – in the three main languages of the region, namely English, isiXhosa and Afrikaans. All items were produced and released by the CCT. Items included in the analysis consisted of speeches, press releases, public summaries, posters, pamphlets, photographs, presentations, information guides, infographics and a newsletter.[28] Table 4.1 outlines the types of items included in the sample. The prerequisite terms included in the communications in order to qualify for analysis in this project were "water

[28] Items including reports, punitive measures, resource strategies, policies and by-laws were not included in the sample as these items do not communicate directly with the public.

shortage", "water crisis", "drought" or "Day Zero", with the exception of photographs, which do not contain text but nonetheless were intended to communicate a message relating to the water shortage.[29]

Table 4.1: Types of items sampled	
Type of communication	**Explanation of item types**
Speeches	Speeches by the executive mayor containing information relating to the water-shortage.
Press releases	Press releases mostly in the form of statements by the executive mayor or her team.
Public summaries	Public summaries containing details and information about a particular aspect relating to the water-shortage according to the City and intended for the public.
Posters	Posters that were scalable and intended to be displayed at strategic points with high foot traffic or where water behaviour physically occurred (e.g. near bathrooms).
Pamphlets	Pamphlets promoting water-use reduction, intended for mass copy and circulation.
Photographs	Photographs relating to the water shortage, including with and without text overlays.
Presentations	Presentations in the form of PowerPoints, with information and visuals related to the water-shortage.
Information guides	Information guides with dense text to explain a specific water-saving measure's recommended processes and risks to avoid.
Infographics	A visual-based poster depicting simplified details or a flow of information.
Newsletters	A newsletter by the CCT containing information and short articles about the drought, promoting the need to conserve, and ways to reduce water use.

4.4 Analysis

This project uses an abductive approach to reveal the set of frames used by the City. Where deductive reasoning applies general rules to derive specific conclusions, and inductive reasoning draws from specific observations to produce wider generalisations (Soiferman, 2010), abduction offers an alternative to using either a deductive or inductive approach exclusively. Abductive reasoning is not simply a mix of deductive and inductive approaches, however it does combine aspects of the two approaches and seeks to draw conclusions about the cause-and-effect of the event under study (Dubois & Gadde, 2002). Abduction draws on empirical observation to produce the simplest or most likely explanation of phenomena. Abduction opens up space for the discovery of other variables and complex nuances which help to explain the events

[29] Some photographs were released as part of ThinkWater, an initiative established during the drought by the City to communicate ongoing information about the state of water supply in Cape Town and water-saving behaviour. It is ongoing at the time of writing.

under observation and brings together previous ideas with the current event under study, drawing on prevailing knowledge to lay the groundwork and then engaging with the data itself to cross-analyse possibilities (Dubois & Gadde, 2002; Eriksson, 2012). This was an ideal approach as it allows for the influence of past research to shape and guide the study, while allowing for frames to be identified inductively through the analysis of empirical data. Figure 4.2 illustrates the abductive process used for this study.

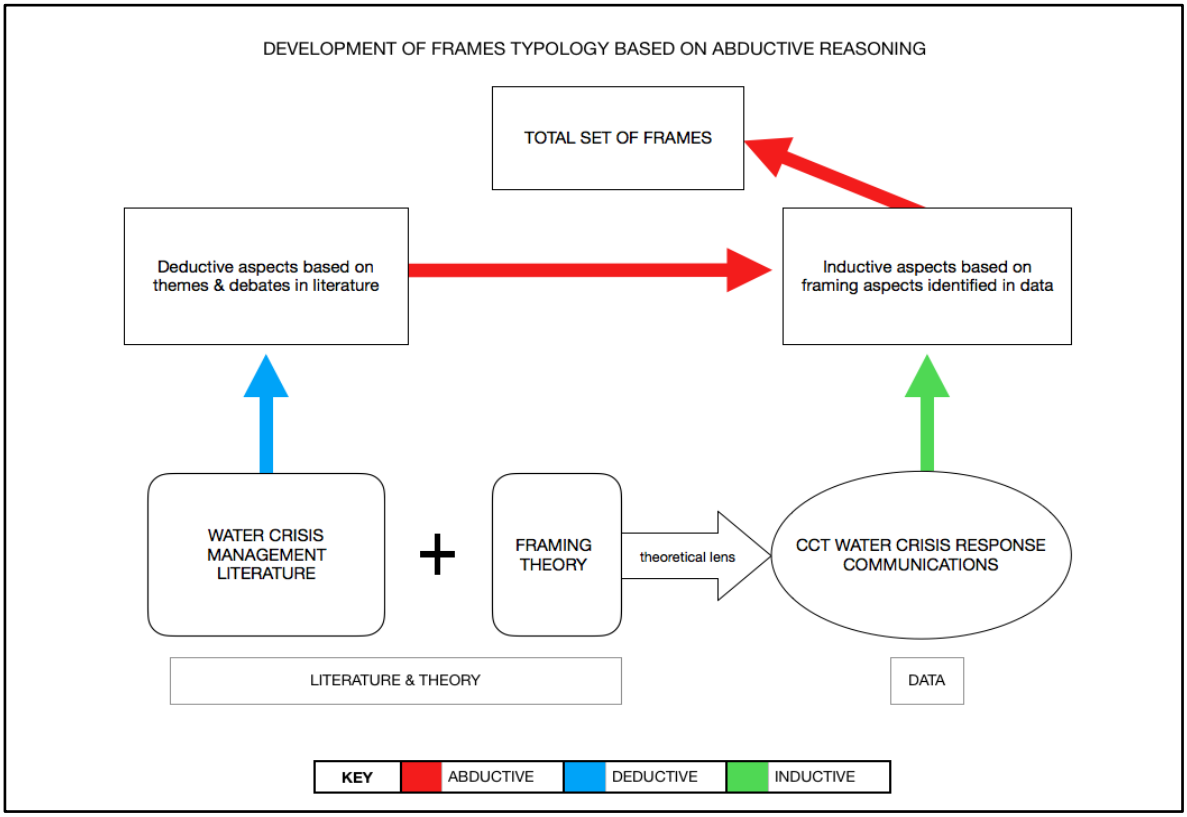

Figure 4.2: Process of abductive approach adapted for this study (source: author)

The water crisis in Cape Town was not an isolated event, nor were the CCT's communication items released entirely randomly. There was a context which shaped the need for, and nature of the communication items put out to the public. For this reason, it is useful to make use of past research and experience which may prompt questioning and comparisons about the current event under analysis (Eriksson, 2012). From the outset, the main aspects which were deductively flagged as potentially important were the nature of the crisis, the nature of the problems, the suggested solutions, and the allocation of responsibility put forward in the communications. Framing is by nature situation-specific and therefore each study requires a knowledge of the context. However, while there were broader factors to consider, there were also factors

and nuances that are unique to the CCT's communications, which could only be identified inductively during analysis. It is important to note that inductive reasoning works on the premise that frames are not necessarily explicit but also implied via clues such as metaphors, imagery, word associations and other elements, all of which are known as devices or reasoning devices (Ardèvol-Abreu, 2015). The researcher then draws associations between these elements in order to make meaningful associations amongst the data.[30]

While there was a heavy reliance on inductive reasoning to identify frames, the abductive approach ensured that the subject of study was not analysed without considering the broader literature on drought crises which offered valuable insight and grounding for the study. Similarly, the abductive approach works against the main shortfall of a purely deductive study which is the exclusion of critical information simply due to the fact that it was not detected and defined prior to analysis (Ardèvol-Abreu, 2015). As with inductive reasoning, an abductive approach cannot offer certain truths, but unlike inductive reasoning it does not seek to make broad generalisations. Abductive observations rather focus on finding the best explanation vis-à-vis the state of a particular event, especially when observations are incomplete (Dubois & Gadde, 2002). Through this combined approach, potential patterns and trends could be observed, building up a tentative understanding of the City's framing of the water crisis which could then be used to explore possible conclusions (Soiferman, 2010).

The data was analysed manually using excel spreadsheets which facilitated more flexibility and allowed for the discovery of new or more nuanced frames to be identified throughout the analysis process than may have been observed using other computer programmes designed for qualitative analysis. An initial scoping analysis captured practical details such as medium, intended audience, blame and hero positioning, and relevant quotes or excerpts on a spreadsheet [see appendix I]. A second spreadsheet was created to capture any framing aspects that were identified in the data [see appendix II]. Data was then cross analysed to check and confirm framing aspects. Together, the information from these spreadsheets was analysed to deduce prevalent key frames amongst the data. Once the key frames were established, data was again analysed to recognise which key frames occurred in which items on a third spreadsheet [see appendix III]. As far as possible, each spreadsheet listed items according to date which helped to illustrate trends and shifts over time.

[30] A full breakdown of frames and associated reasoning devices appears in the results chapter.

4.5 Limitations and challenges

Due to time constraints and the pre-set word limits of this thesis, this study is limited to communication items released by the CCT municipality during the drought period which specifically spoke to a public audience and which were made available online. Data sampled is therefore a subset of the total communication items released by the CCT during the crisis period. Communications regarding budgets, reports, punitive measures, resource strategies, policies and by-laws are not included. These communications are largely technical and serve to guide decisions at management level, and while they are important items, they do not target the public specifically, which is the focus of this research. Similarly, there were aspects of the campaign that targeted business and industry which were also important for the Cape Town water crisis but these are not dealt with in this project. There is potential for further research regarding framing in these items.

Furthermore, there are perspectives and nuances from other stakeholders with other frames of the water crisis which are not considered in this research project. There were, for example, other Day Zero related campaigns launched by the Democratic Alliance (the political party in leadership in the City of Cape Town and the Western Cape government at the time of the drought) and independent groups, such as radio stations and internal drives at universities, schools, malls and businesses. There is therefore potential to also do further research in these areas. While this project offers a deeper understanding of how the CCT framed their position in relation to the crisis in their communications to the public and how this may have changed over time, the frames and stakeholder dynamics identified here are limited. The more complex back-and-forth discourse and shifting frames associated therewith between multiple stakeholders and the City during the water crisis is also an area with future research potential.

As there is no way to explain exactly how many people saw each communication item released by the City during that time and to what extent that item of communication was assimilated in the receivers' minds, each piece of communication is assumed to have equal reach and influence, however it is probable that some items were more influential than others. Additionally, the sample dates were chosen based on the declaration and denouncement of a crisis period. It is possible that there are other notable trends preceding and following the crisis period, outside of the sample bounds, which may not be captured in this study.

One of the challenges associated with this study is that it relied on the City's website to collect data. The website is subject to updates, and as a result it is possible that there are some omissions of items that would otherwise have been eligible for inclusion in the sample but were not obtainable. Similarly, the City's

document search tool also pulled up a handful of items with deadlinks that may have possibly been eligible for analysis but were not available.

It is worth noting that in 2019, the CCT commenced a process of reflection in order to analyse their communications campaign during the water crisis response period. This is a relatively recent development and as such the nature, objectives and findings of this work are yet to be understood.

4.6 Conclusion

This chapter has covered the four main aspects of methods for this study, namely, data collection, sampling, analysis, and limitations and challenges. The data collection section explained how data was sourced via the CCT's online document finders. This section also explained how the study focuses on particular communication items released by the City during the crisis period (03/2017 – 03/2018) which aimed to communicate the water shortage to the public and which were made available online. The sampling section explained how items were selected for inclusion, specifically types of items, language, terms included and the temporal bounds. The analysis sections explained how the data was processed and coded using an abductive approach which allowed for the inductive identification of framing aspects inherent in the data set, while also considering the deductive influence of wider research.

Chapter 5

The framing of drought crisis communications by the CCT

5.1 Introduction

This chapter presents the findings of the study. Utilising an abductive approach, the analysis provided multiple sets of information, including types of items of communication released, temporal spread of items, the identification of types of frames used by the CCT in the communications, and the frequency of those frame types. The findings aim to address the objectives of the research. The chapter is structured into five sections starting with the number and types of communication items in the data set dealt with in section 5.2. Section 5.3 explains two main streams into which the data was divided. Section 5.4 deals with the analysis and development of a table of framing aspects. Section 5.5 describes the six main frames that emerged from the data, and lastly section 5.6 offers a timeline of the frequency of these frames occurring over the crisis period (03/2017 – 03/2018).

5.2 Communication item types

Based on the sampling criteria, 57 items qualified for analysis. In total, there were 10 types of communication items in the data set including speeches, statements, public summaries, posters, pamphlets, photographs, presentations, information guides, infographics and a newsletter.[31] Figure 5.1 presents the number of different item types released during the crisis period (03/2017 – 03/2018) by percentage. The item type with the most releases during this time were statements made by the executive mayor and the City of Cape Town with 42.11%. Though far less, other types of communication items with moderately high numbers of releases include posters and photographs of which both had 12.28% respectively, and speeches with 10.53%.

[31] Item types refers to the medium or format in which a communication item was presented.

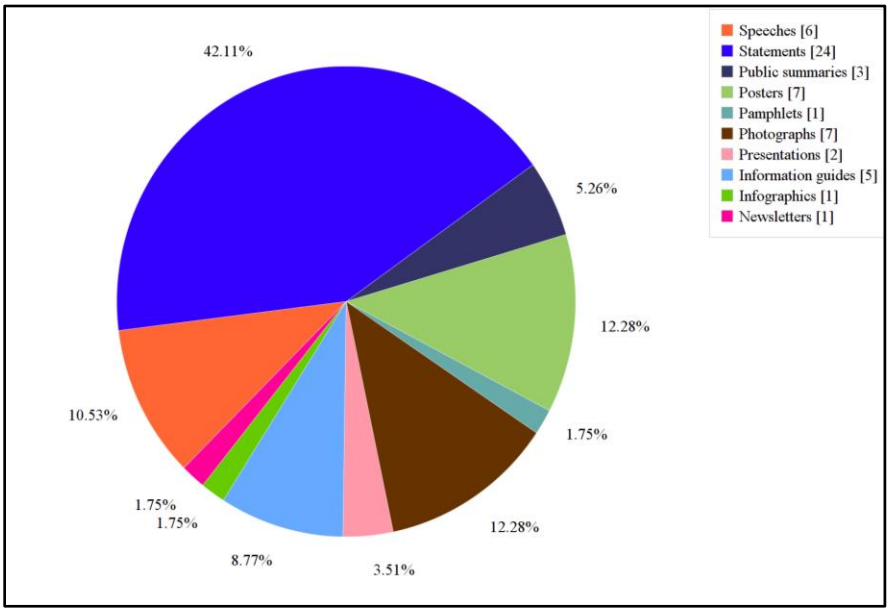

Figure 5.1: Various types of communication items presented by percentage

5.3 Two streams of communication types

During the initial stage of analysis, the investigation revealed that two distinct streams of communication types emerged from the data, namely the positioning/status stream and the instructional/educational stream. The positioning/status stream, referred to as stream A, consisted of official communications released by the executive mayor and the City which comprised of speeches, press releases and public summaries, which expressed the status of the crisis according to the City and positioned the roles of responsibility in managing the crisis. The instructional/educational stream, referred to as stream B, consisted of communication items which offered drought information and water-saving instructions to the public in the form of posters, photographs, information guides, infographics and a newsletter. In total, stream A comprised 33 items and stream B had 24 items [Table 5.1]. Table 5.1 shows the total number of items in each stream as a percentage of the entire data set. Stream A had more items with 58%, while stream B accounted for 42% of items [Table 5.1].

Table 5.1: Total number of items in each stream

Stream A:	33 (58%)	Stream B:	24 (42%)	Total items:	57 (100%)

5.4 The identification of framing aspects

The second part of the analysis process consisted of identifying and noting all the characteristics, or aspects, of framing explicit or implicit in the data. These aspects were identified inductively through the analysis process and a total of 33 framing aspects were identified. The aspects of the frames were not mutually exclusive or binary. Table 5.2 shows all framing characteristics identified as well as words, symbols and imagery devices associated with each. For a breakdown of framing aspects identified in the data, see appendix II.

Table 5.2: Framing aspects and associated devices

	Framing aspect	**Description**	**Devices (associated terms, metaphors, symbols or characteristics)**
Crisis status	Crisis	The water shortage is framed a crisis	"Day Zero", "crisis", "further decline", "disaster", needing saving
Purpose of item	Provide information	The purpose of the communication is to provide information to the public	Mention of dam supply levels, "improved public understanding", explanation of CCT/mayor's actions, educational/informational aids
	Persuasive/motivational	The purpose of the communication is to persuade or motivate public participation	Encouraging/motivational phrases
	Recommending	The purpose of the communication is to recommend certain actions by the public	Reference to reductions in outdoor water use
	Enforcing	The purpose of the communication is to enforce restrictions on the public	Tariff increase, water management devices
Priority	Environmental	The main area of concern is framed as the environmental effects of the water crisis	Reference to interventions in water catchment areas (e.g. removing alien vegetation); emphasis on low water levels in dams
	Social	The main area of concern is framed as the social effects of the water crisis	"Well-being", "community", "health and hygiene"
	Political	The main area of concern is framed as the political effects of the water crisis	Bureaucratic challenges (e.g. approval from national level)
	Economic	The main area of concern is framed as the economic effects of the water crisis	"Economy", "costs", "financial year", "commerce"
Cause	Human activity induced	The framing of the cause of the water crisis is ascribed to human activity	"Save water while we have it", "using too much", positive reference to water reductions. reducing demand enhances supply in dams
	Natural occurrence	The framing of the cause of the water crisis is ascribed to natural phenomena	"Drought", "reduced annual average rainfall", lack of rain, lack of water in dams
Problem rendering	Technical issue	The nature of the water crisis is framed as a technical problem	"Boreholes", "desalination", "pressure management", addressing infrastructure (leaks, etc.), technocratic and scientific language
	Consumption issue	The nature of the water crisis is framed as a matter of excessive consumption	"Demand management"
	Hydrological issue	The nature of the water crisis is framed as a hydrological problem	"Hot weather (summer)", "further decline", "drought", "climate change"
Temporal framing	Long-term	The temporal framing of the water crisis is long-term/permanent	"Not going away", "new normal", "water "Security"
	Short-term	The temporal framing of the water crisis	A near end is implied, "navigate this period",

		is short-term/temporary	"get through this together", "immediate future"
Reach	Pervasive	The reach of the water crisis is framed as pervasive and city-wide or beyond	Reference to Cape Town region, "all our futures"
	Isolated to certain areas	The reach of the water crisis is framed as affecting isolated or certain areas	"High-lying areas"
Management	Under control	The management of the water crisis is framed as under control by managing authority	"We will not let a well-run city run out of water", reference to mitigation measures coming into place
	Uncontrolled	The management of the water crisis is framed as uncontrolled by managing authority	Spikes in consumption, targets not met
	Controllable	The management of the water crisis is framed as controllable by managing authority	"Supply schemes', 'reduction programmes", "restrictions", "targets", "save water while we have it"
Responsibility	Responsibility of the government	The effects of the water crisis are framed as the responsibility of government	"Emergency schemes", "augmentation", "culture of water harvesting", "proactive government"
	Responsibility of the public (personal)	The effects of the water crisis are framed as the responsibility of the public	Reference to consumption, reference to reduction measures, "save water while we have it"
Understanding of effects	Effects are understood	The effects of the drought are framed as being known and understood	
	Uncertainty about effects	The effects of the drought are framed as being unknown or uncertain	"We never pretended to have all the answers"
Affected demographics	Wealthy will be/are affected	The water crisis is framed to affect more affluent demographics	
	Poor will be/are affected	The water crisis is framed to affect poorer demographics	"Most vulnerable residents of the city are least able to adapt to an escalating disaster"
	All demographics will be/are affected	The water crisis is framed to affect all demographics	"All our futures"
Other aspects	Moral issue requiring collective effort	The water crisis is framed as a moral issue requiring collective efforts for effective solutions	Combined support in drought efforts, reference to engaging different sectors, "Team Cape Town", "the only way through this is together", "care a little, save a lot", "you should/should not…"
	Health threat	The water crisis is framed as a threat to public health	
	Resilience framing	The water crisis is framed as a matter of resilience	"Resilience", preparing for long term change, "permanent basis"
	Threatening frame	The water crisis is framed as requiring threats to high users by management	"Warning", "penalties", "force them", disapproving tone, reference to citizens' legal responsibilities
	Conflict framing	The water crisis is framed as a fighting matter in opposition to the City and the people of Cape Town	Military language, "aggressive", "remain vigilant", "beat this together", "(water saving) heroes"

5.5 The six main frames used by the CCT in their communications

The third stage of analysis involved the analysis of framing aspects in relation to the communication items to identify prominent clusters which signified frames. Drawing on Entman's (2007) idea that a fully developed frame generally enacts four functions (namely problem definition, causal analysis, moral

judgment and remedy promotion) six main frames were identified as tabulated in table 5.3. For all six frames the definition of the problem was unanimous – it was a water shortage caused by a three-year drought period. For this reason, table 5.3 does not include a column for problem definition. The six main frames are: 'the City success story'; 'obscurity and ambiguity'; 'consumption is key'; 'the situation is controllable'; 'together we can beat the drought'; and 'us versus them'. Below is an explanation of the six main frames:

5.5.1 The City success story

This frame is primarily concerned with framing the City in a positive, heroic manner, with the City stating that it "*... will continue to use absolutely all drought interventions at its disposal*" (City of Cape Town, 2017aj). The water shortage is framed externally as a hydrological drought phenomenon, and technical solutions and pressure management are suggested to minimise risk [see table 5.3]. It is implied that the situation is 'controllable' and under control as a result of the efforts of the City, who suggest that "…*constant monitoring, updating and revision are key to the dynamic situation*" (City of Cape Town, 2017aj). This is also reflected in a response to the City's Critical Water Shortage Disaster Plan, in which the City states that their "*... planning approach is not a reflection on the City's confidence in the water supply demand management and augmentation programme, but a strategy to ensure that the City is adequately prepared to manage increasingly severe drought conditions as they intensify over time*" (City of Cape Town, 2017aj). The CCT is framed as a responsible management authority who are invested in the wellbeing of the public, with statements coming from the City, assuring the public that they "*... will not allow a well-run city to run out of water and this will be achieved through progressive savings and our multi-layered augmentation plan to build water resilience*" (City of Cape Town, 2017ai), and that "*the City will do everything in its power to ... ensure that Phase 3: Day Zero (full-scale disaster implementation) never occurs*" (City of Cape Town, 2018f). This frame promotes political proficiency for the City by presenting the drought as an anomaly; it does not acknowledge previous planning and infrastructural insufficiency and casts its provision and management of water as a success. The City is presented as reliable and responsible in that even in the face of a climatic anomaly it is able to provide technical solutions and keep Day Zero from occurring.

5.5.2 Obscurity and ambiguity

This frame is defined by vagueness, ambiguity and complexity, without clear positions for the CCT [see table 5.3]. Items hint at hydrological anomaly, various technical limitations, high levels of consumption or a combination of these problems as the cause of the water shortage, but do not provide firm ideas or positions. An example where this frame is prevalent is the series of photos of the WCWSS dams published by the City; taken from various angles, these images emphasize low water supply with pronounced sand

beds, beaches and rocks, dried up surrounding vegetation and dry mountain tops in the background. These images contain no text, notes or contextual information (City of Cape Town, 2017o; City of Cape Town, 2017q; City of Cape Town, 2017v; City of Cape Town, 2017w; City of Cape Town, 2017x). These items are simplified to the point of obscurity; problems and solutions are either not suggested at all or are unclear. There is ambiguity about the nature and state of the drought as well as the solutions and response approach by the City. There is also temporal ambiguity regarding how long the drought will last. The City renders the matter complex in statements such as the following: "*The procurement and commissioning of multiple new augmentation schemes in rapid time is going to be one of the largest and most complex expenditure programmes in the history of the City of Cape Town*" (City of Cape Town, 2017ad). The City implies that they are the only appropriate administrator with the relevant knowledge and skills to deal with the situation. However, this frame also has a lack of measurability of the drought and thus a lack of accountability.

5.5.3 Consumption is key

This frame is a straightforward appeal to the public for reductions in water use [see table 5.3]. Critical to the problem is high levels of private consumption (individual and household) and the most effective method put forward to reduce risk is to drastically reduce consumption, especially personal and household consumption, which would thereby delay Day Zero. This appeared in many examples, including information guides which offered water-saving tips such as less frequent toilet flushing, shorter showers, fitting flow restrictors and using grey water, and encouraging residents to change their consumption habits in statements like, "*the more you save, the less you pay – and more water remains in our dams*" (City of Cape Town, 2017t). Similarly, the 'save like a local' campaign targeted tourists and visitors to be more careful when using water. Items from the campaign stated that "*Cape Town is experiencing its worst drought ever*" and recommended visitors "*wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth*" (City of Cape Town, 2017k; City of Cape Town, 2017l; City of Cape Town, 2017m; City of Cape Town, 2017n). Another example focused on minimising flushing through a toilet pledge to be placed in bathroom stalls, which stated that the community using said bathroom "*... pledge to: let it mellow if it's yellow, only flush when necessary [and] not use the toilet as a dustbin*" and reminded users that "*every time we don't flush, we're saving about 9 litres of drinking water*" (City of Cape Town, 2017i). Essentially in this frame the City renders the situation a matter of behavioural change; "*Cape Town, this is the moment where we can bring about the fundamental behaviour change that is needed to save us all from running out of water. The time to act for everyone's sake is now. So if we reduce the demand enough now, we can still get our water delivered to our houses and not have to queue daily for our allocation*" (City of Cape Town, 2018ao). The frame targets behaviour change and is delivered through information, restrictions and messages of

encouragement.

5.5.4 The situation is controllable

The primary focus of this frame is to offer assurance regarding the City's ability to ensure order. The frame points to the hydrological drought and high levels of private consumption as the main causes of the problem [Table 5.3]. It indicates a mixture of technical solutions and demand management. Some solutions are suggested but the goal is not so much about promoting a solution, but rather about promoting the notion that the situation is manageable and by extension that it is/will be kept under control by the City. In one example, it states, "*if everyone is frugal, residents will be able to get water from their taps throughout this year,*" it then goes on to say that, "*we [the City] will be ready, if we have to. But, Team Cape Town, if we all stick to 50l a day, we won't have to*" (City of Cape Town, 2018a). It is also noted that "*additional sources will not stop the crisis, but help ease usage and allow the dams to refill over the next two years*" (City of Cape Town, 2018a). The frame has a 'keep calm and carry on' undertone, with the City stating that "*what we are currently facing is not unique. Many cities around the world have to deal with the impacts of climate change*" (City of Cape Town, 2017ah), and that "*this is going to become the new normal for Cape Town*" (City of Cape Town. 2017aa). The situation may not necessarily be under control, nor fully understood, but the frame aims to provide a stabilising effect for the public. For this reason, the City states that it "*...will continue working on a range of augmentation plans, fast-tracking processes as much as possible to bring alternative sources of drinking water online, including desalination, ground water extraction, and water reuse as we build a water-resilient Cape Town*," adding that "*...together with the great water-saving efforts of residents, we will make it through this unprecedented drought*" (City of Cape Town, 2017ak). Though similar to 'the City success story,' this frame is less orientated towards promoting the proficiency of the governing party, and more interested in ensuring stability and fostering peace of mind amongst the public.

5.5.5 Together we can beat the drought

This frame aims to unify the public and the City by setting up the drought as a common enemy. It focuses on high levels of private consumption [see table 5.3]. In addition to reducing private water consumption, the City is contributing to the war on the drought through technical solutions and demand management. The public and the City are united in a common cause to overcome the water shortage. In one example, the City state that they are "*...doing absolutely everything in its power to get Cape Town through this drought but we need the support of our residents. Water is life. We urge you to join the efforts of the City and so many Capetonians to beat this drought together and to avoid Day Zero, the day when our taps run dry*" (City of Cape Town, 2018d). Another example contains a series of posters of residents faces and quotes about how and why they are saving water, with residents stating that, "*I'm saving water because our lives*

depend on it," "*I'm saving water while we still have water to save,*" "*I'm saving water, so we don't have to queue for it*" and the common slogan "*together we can avoid Day Zero"* (City of Cape Town, 2018d). By appealing to collective effort, this frame uses notions of social belonging to persuade the public to get/be involved in practical consumption changes. One image depicts a dried-up dam with text overlaid, stating "*Lets save, Cape Town! Together*" (City of Cape Town, 2017a). In another example, the mayor expresses thanks to all "*... visitors and locals for their efforts to continue to save water. We cannot do it without you*" (City of Cape Town, 2018b). This frame also uses military and/or sport language to facilitate groupthink through phrases such as "*Team Cape Town*" (City of Cape Town, 2018a) and "*beat this drought*" (City of Cape Town, 2018d). The City also states that "*Day Zero can be avoided*" and that "*Capetonians have done amazing work to save water. Most residents are saving water but we need every single person to use the prescribed 87 litres per person per day. If we don't have everyone restricting their water consumption, we will reach Day Zero…*" (City of Cape Town, 2017ao). Additionally, the plight of the drought is portrayed as the great leveller bringing together disparate classes of Cape Town residents.

5.5.6 Us versus them

This frame externalises the problem, causes and solutions for the water crisis away from the City. It focuses on high levels of private consumption and places much of the responsibility of remedying the situation on the public, who are cast as needing to change their behaviour in order to achieve the necessary water reductions [see table 5.3]. Focus is shifted away from the City's efforts by putting forward the idea that the actions of the public are most critical to remedying the situation. In one example, which speaks about level 6B (50 litres daily limit per person) restrictions coming into place, the City expresses that "*Day Zero is now likely*" and that "*60% of Capetonians won't save water and we must now force them*" (City of Cape Town, 2018ao). The public are framed as misbehaving and not considerate enough regarding the situation. For this reason the City states that they had *"...to install water management devices at 18 597 high consumption households across the city so far where contraventions have occurred*" and adds that "*the Water and Sanitation Department staff are working extremely long days to help the City conserve water by restricting delinquent users. We have begged people to save water, but we cannot allow the flagrant abuse of water to continue unabated*" (City of Cape Town, 2017at). In another example, the CCT state that they "*... have issued more than enough warnings and pleaded with residents to reduce consumption, but there are still too many people who continue to flout water restrictions… but the time for asking people to reduce excessive consumption is over and we will now forcibly restrict those households who continue to contravene water restrictions*" (City of Cape Town, 2017ac). In this frame, the CCT sets themselves up against the public; they exert and flex their authority to prompt behaviour change using threats and scare tactics.

Table 5.3: Key frames identified			
Frame	**Causal analysis**	**Remedy promotion**	**Moral judgements**
THE CITY SUCCESS STORY	Hydrological drought caused the water shortage	Technical solutions, pressure management	CCT is a responsible management authority
OBSCURITY AND AMBIGUITY	Hydrological drought, technical limitations, and high levels of consumption caused the water shortage	Solutions to the problem are not clear	Frame is defined by vagueness and ambiguity of the crisis situation
CONSUMPTION IS KEY	High levels of private consumption (individual and household) was the primary factor that caused the water shortage	Private consumption reduction	Most effective method to reduce risk is to reduce consumption
THE SITUATION IS CONTROLLABLE	Hydrological drought together with high levels of private consumption (individual and household) caused the water shortage	Mixture of technical solutions and demand management	Ensure the CCT's ability to ensure order
TOGETHER WE CAN BEAT THE DROUGHT	Hydrological drought together with high levels of private consumption (individual and household) caused the water shortage	Private consumption reduction, technical solutions and demand management	Public and City are united in common cause to overcome the water shortage
US VERSUS THEM	High levels of private consumption (individual and household) caused the water shortage	Water-saving behaviour by the public	Problem, cause, solution and responsibility are externalised away from the City

5.6 Frequency of frames

Once the six main frames used in communications by the CCT were established, data was further analysed to identify the frequency and temporal spread of frames occurring. Figure 5.2 and figure 5.3 illustrate the frequency of frames in the positioning/status stream (stream A) and the instructional/educational stream (stream B) respectively as they occurred between March 2017 and March 2018. Figure 5.2 and figure 5.3 are presented in a timeline format to illustrate trends and shifts over time.

In terms of general temporal range, months with markedly high volumes of frames identified coincide with months with higher volume of items released by the CCT for both stream A and stream B. The frames in stream A are more spread out over the 13 months with a notable increase for all six frames between October 2017 and January 2019 [see figure 5.2] when the crisis was at its peak. Stream B is more concentrated in October, November, December of 2017 and February 2018 (with the exception of the 'obscurity and ambiguity' frame which also occurred in March and July of 2017) [see figure 5.3]. In terms of highest frequencies by month, stream A had a peak of the highest frequencies occurring for all six streams in

November 2017, and stream B saw the highest frequencies occurring in December 2017.

Overall, the frame which consistently occurred the most in stream A was 'the City success story' frame, followed closely by the 'consumption is key' frame [see figure 5.2]. For stream B, the frame with the most occurrence across the 13-month period was the 'together we can beat the drought' frame, followed closely by 'the situation is controllable' frame [see figure 5.3]. Reflecting on the prevalence of these frames more specifically, the frame with the overall highest frequency by month for stream A occurred in November 2017 and was 'the City success story' frame [see figure 5.2]. For stream B the frame with the overall highest frequency was 'the situation is controllable' frame in December 2017 [see figure 5.3].

All six frames were identified in the positioning/status stream (stream A) to some degree [see figure 5.2]. However, in the instructional/educational stream (stream B), all but one of the six frames were identified – the outlier being the 'us versus them' frame [see figure 5.3]. The 'us versus them' frame was also the frame with the least occurrences overall. In the case of stream A, it did occur but was the least occurring frame across the timeframe, while in stream B it did not occur once. For a breakdown of results, see appendix III.

5.7 Conclusion

This chapter relayed the findings of the research. It began by offering a breakdown of the numbers and types of communication items included in the analysis. This included 10 types of communication items comprised of speeches, statements, public summaries, posters, pamphlets, photographs, presentations, information guides, infographics and a newsletter. It then explained the emergence of two main streams within the data set, namely the positioning/status stream, stream A, and the instructional/educational stream, stream B. The next section noted all the characteristics of the frames which were identified in the data, which included multiple aspects relating to the status of the crisis, the purpose of the communication item, the priorities put forward, the cause suggested, the rendering of the problem, the temporal framing, the reach of the crisis, the position of management, the placement of responsibility, the understanding of effects relating to the crisis and the affected demographics amongst other aspects. Following this was an overview of the six key frames that emerged, namely 'the City success story'; 'obscurity and ambiguity'; 'consumption is key'; 'the situation is controllable'; 'together we can beat the drought'; and 'us versus them'. Finally, the last section provided an overview of the frequency of frames occurring over the crisis period (03/2017 – 03/2018) with a timeline to illustrate this, showing that as the crisis peaked, so too did the volume of frames present in communications released surge. It also noted frames with the highest and lowest counts over the 13-month period. The next chapter discusses the project's findings.

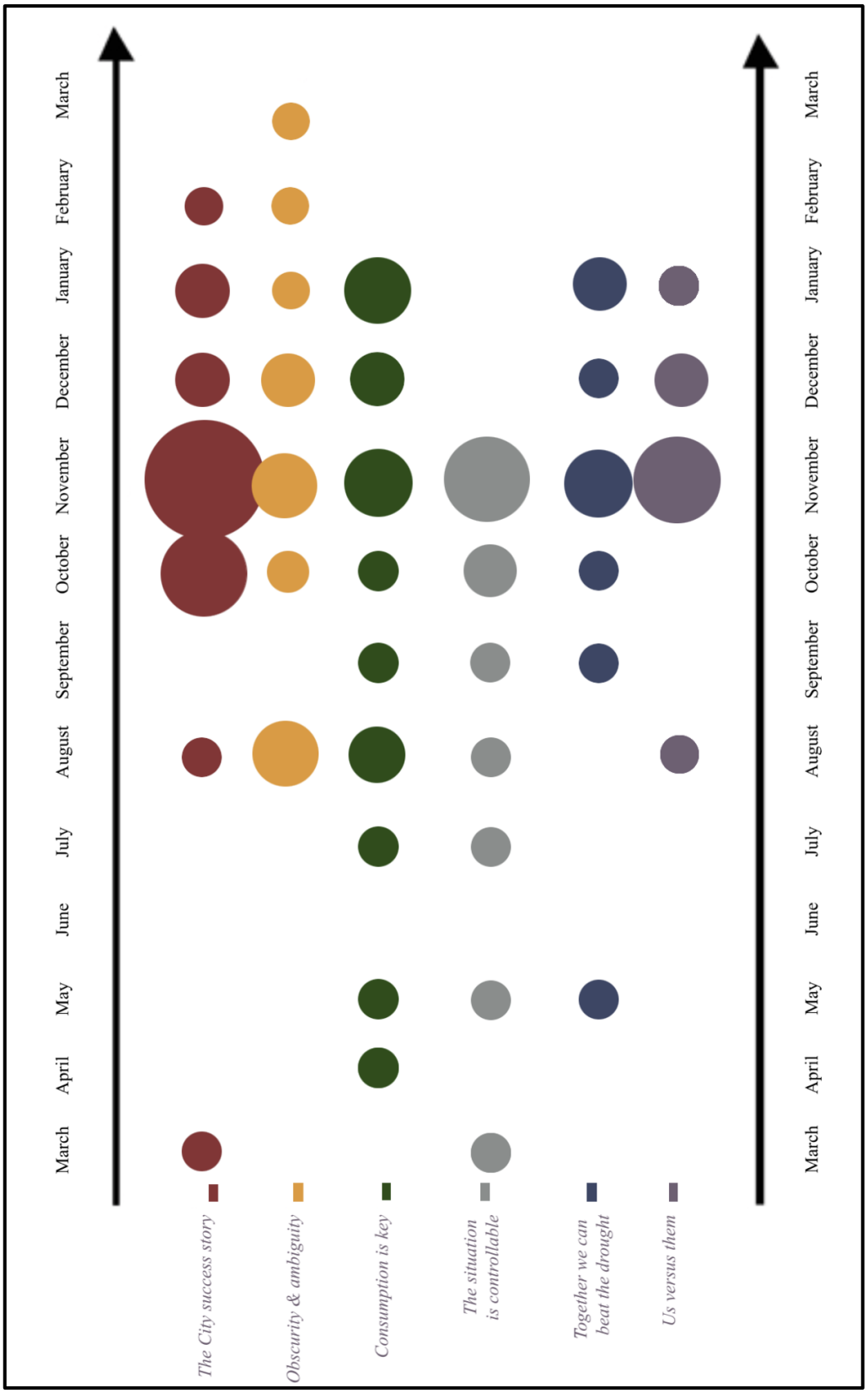

Figure 5.2: Timeline of frequency of frames occurring in stream A between March 2017 and March 2018

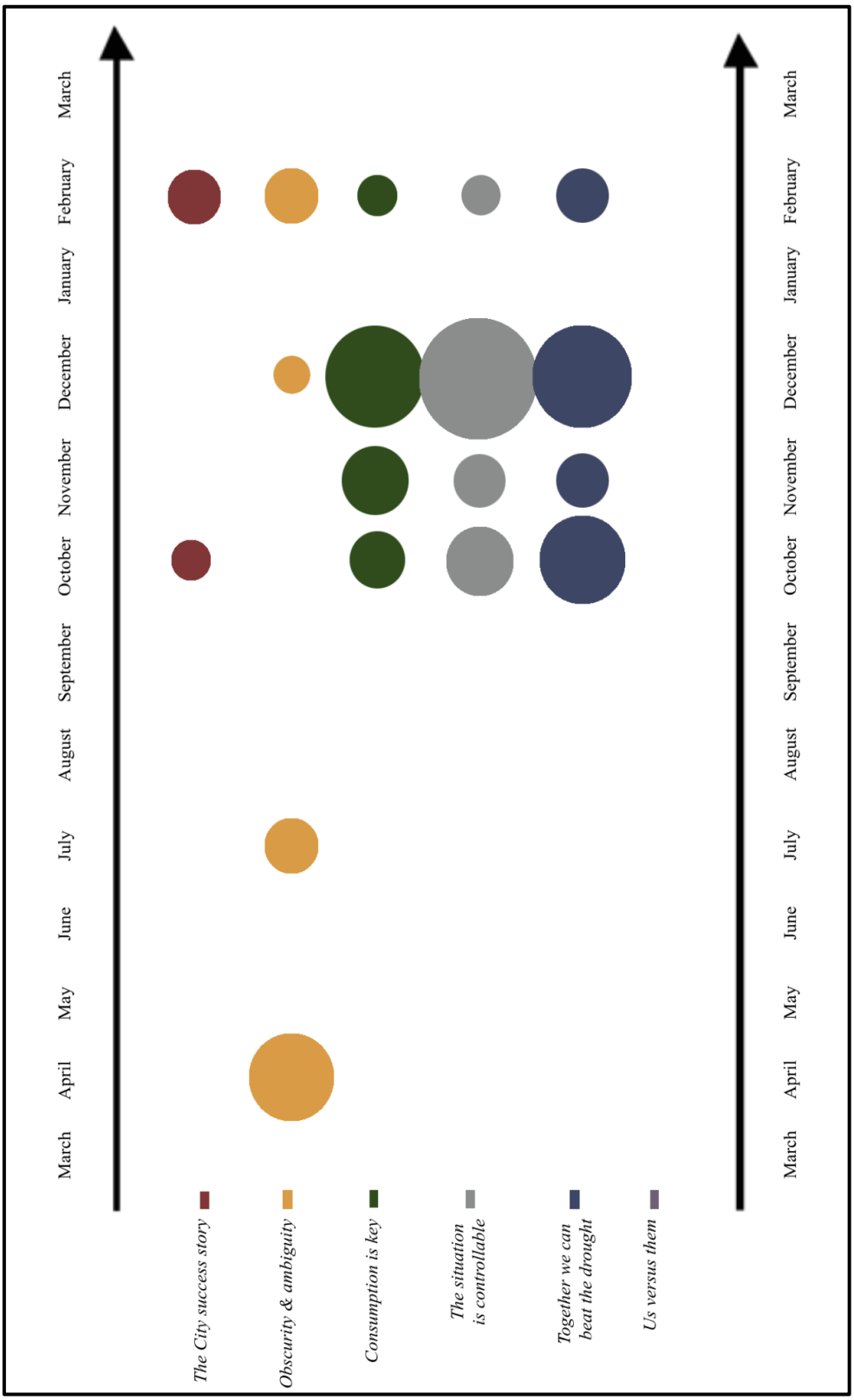

Figure 5.3: Timeline of frequency of frames occurring in stream B between March 2017 and March 2018

Chapter 6

Discussion

6.1 Introduction

This chapter discusses the trends and shifts in the CCT's framing of the water crisis. The chapter is divided into three main sections: section 6.2 discusses each frame as it relates to wider literature; section 6.3 explores the temporal trends of the framing in the two stream of the City's communications; and section 6.4 critically analyses whether the delivery of messages to the public through communications was the product of clear strategies or a less coherent, less organised process.

6.2 A theoretical analysis of the City's framing of the drought

Building on the results of the previous chapter, which offered an overview of the six key frames identified by the analysis, this section offers a more critical breakdown of each frame as it relates to the literature. In line with the ideas of Kohl and Knox (2016), the water crisis was not an entirely external and objective occurrence; intentional or not, the water crisis communications were used by management to frame various aspects of the drought and to assert City agendas through information and messages released. By defining the water shortage through particular frames, the City could promote certain courses of action, influence the sense of perceived risk for the public, and affect how the crisis was experienced and understood (Laws & Rein, 2003). This section offers a deeper understanding of each frame identified during the analysis stage of the project.

6.2.1 'The City success story' – more about the City than success

This frame positions the City in a heroic light and advances ideas of power and capability associated with the City. Central to this is the external placement of the cause of the problem. Treating the water shortage as a wholly external hydrological phenomenon implies that the City's pre-drought infrastructure, planning and policy was adequate and that the water shortage was entirely the result of a drought anomaly. This framing implies the City's efforts to manage the crisis are admirable and positive, and not necessarily an obligatory responsibility (Kohl & Knox, 2016). It overlooks the fact that infrastructure and planning was possibly outdated (Ziervogel, 2019) or insufficient. It focuses on technical solutions, water pressure management, and showcasing the City's attempts to avoid Day Zero. It implies that the City is a trustworthy

and responsible management authority. In this way the City's actions to take responsibility to remedy the situation work to cast City efforts as successful in that they were still able to provide water to the residents of Cape Town and thereby ensure a well-functioning city. By promoting political proficiency, this frame highlights how frames are inherently about power and how the institution in power, in this case the City, constructs and directs a narrative, position the public, and create structure and meaning for understanding and experiencing a situation (Entman, 2007). Generally, frames are constructed which favour the interests of the institution in power. Interestingly, this frame manages to both draw on scientific and seemingly value-neutral explanations of the drought while also promoting the implicit political reliability of the City (Kohl & Knox, 2016).

6.2.2 'Obscurity and ambiguity' – a situation too difficult for public understanding

A water shortage is a complex situation, however it is the responsibility of the authority managing the resource to take appropriate actions to assess the nature of the situation and enact necessary steps to minimise threats associated therewith. They should also be able to communicate this effectively to the public. This is not to say that the City did not do this, but effective communication requires clarity and the vagueness and ambiguity of this complex frame provides nothing concrete for the public because this frame is prone to fragmentation. When an issue is framed in multiple ways it leads to gaps in understanding the problem and therefore hinders appropriate ways forward (Hurlbert & Gupta, 2016). This frame is problematic because the communications lack intention and purpose, and do not reflect clear objectives of the City. Problems and solutions were either not suggested or were unclear, and there was ambiguity about the nature of the drought, including temporal predictions. While there may have been very real ambiguity with regards to how the drought would play out, the frame is controversial in that it is not directive, neither reassuring nor condemning. The only aspect with a strong resonating factor in this frame is that the City is the only appropriate administrator with the necessary knowledge and skills to handle the situation. There is a kind of 'leave it to the professionals' attitude which comes through, which is also associated with 'the City success story,' but as a crisis heightens, this kind of framing can lead to frustration amongst the public (Hurlbert & Gupta, 2016). By rendering something complicated, it allows for ambiguity, which in turn allows for a lack of measurability and, by extension, a lack of accountability.

6.2.3 'Consumption is key' – pleading to the public

In times of acute and severe water shortage, implementing water restrictions and targeting water consumption reduction behaviour is an effective short-term solution (Dolnicar et al., 2012). While this is true even in best case scenarios, it is especially true in cases where there is insufficient drought policy and planning. For this reason, during the Millennium drought, the Australian government targeted private water-

use reductions by encouraging personal-use targets (Turner et al., 2016). The literature reports that targeting behaviour change is highly effective for managing a water shortage (Dziegielewski, 1991; Dolnicar et al., 2012; Turner et al., 2016; Liang et al., 2018; Palazo et al., 2019). This is especially relevant for public communications, which should convey the seriousness of the threats likely to occur without major behaviour change (Dziegielewski, 1991). This frame implied that reducing water-use amongst the public was the most effective solution to reduce the chance of Day Zero actualising. This frame communicates that the main problem is high levels of consumption and remedying the situation is largely a matter of behaviour change. While it is possible for a condemning tone to come through, this encouraging frame attempts to be apolitical and was primarily delivered through information, advice about water saving measures and encouraging messages. This was similar to the Australian case where education, water value, behaviour change and the collective good were emphasized over punishments and threats (Turner et al., 2016). Although it must be said that, while lasting much longer than the Cape Town drought, the threats associated with the Australian drought did not reach the extreme precariousness associated with the threat of Day Zero. Nevertheless, the massive drop in consumption levels for Cape Town highlighted the problem of wasteful usage, and reinforced ideas of targeting behaviour change for effective water reductions associated with this frame.

6.2.4 'The situation is controllable' – because the City cannot be out of control

Due to the fact that the City is the authority responsible for managing the situation, it is useful for them to focus on offering stability and assurance to the public. This frame expresses that the situation is manageable and is, or will be, under control as a result of City efforts. This frame has a predictably high frequency of occurrence because a frame is more likely to be accepted when it can offer a sense of security to the public and reassure them that their daily lives are not at risk (Laws & Rein, 2003). The water shortage is communicated as being the result of a hydrological drought but manageable through reducing private consumption of water. This is similar to 'the City success story' but here the City are more concerned with instilling public stability and peace of mind. In the case of most urban water supplies systems, urban water management is responsible for water-related decisions, actions and strategies. Urban water management should ensure adequate access, quality and quantity of water to residents, which is to say that it should ensure water supply is under control (Neto, 2016). Therefore, it is not surprising that none of the City's communications hinted that the situation was out of control. According to this frame, it is not conceivable to have the situation out of the City's control, which is why supply-side options are mentioned in conjunction with demand-side management. While supply-side management is important, focusing on demand-side management is associated with higher effectiveness and less input for management (Turner et al., 2016). Hence the City's push for managing the situation by controlling private consumption in Cape

Town and thereby ensuring the City's ability to control a crisis.

6.2.5 'Together we can beat the drought' – united by a common struggle

This frame makes a strong appeal to social cohesion and collective responsibility to encourage residents to adopt water-saving behaviours. While it was necessary to communicate the severity of the situation in order to prompt behaviour change (Dziegielewski, 1991), the City used words of encouragement and a military and sports register, employing phraseology such as "*Team Cape Town*" (City of Cape Town, 2018a) and "*beat the drought*" (City of Cape Town, 2018d), to frame themselves and the public as unified in a common cause to overcome the water shortage. Promoting the collective value of water as a common good helps to encourage the public to change their consumption habits (Turner et al., 2016). For this reason, the City focused on communal effort and social belonging as drivers for encouraging a collective valuing of water as a shared resource. The water shortage was portrayed as a monumental leveller, bringing together Cape Town's extremely unequal society in the crisis (Robins, 2019). Whether this was indeed true or not, this frame suggests it was the case.

6.2.6 'Us versus them' – the onus is on the public

Whether out of sheer exasperation and desperation, or strategic psychological manipulation, this frame turns attention outwards, away from the actions of the City. Instead, the problem, causes, and solutions are externalised and responsibility is placed on the public. This frame is built on the idea that messages about losses seem to be stronger drivers for behaviour change than messages about gains (Liang et al., 2018). The City asserts that they have pursued every avenue available to alleviate the water shortage and that the situation is salvageable only by the public taking the necessary actions to reduce their water consumption. In this frame the public are viewed as misbehaving, irresponsible and contributing massively to the crisis. The City sets itself up against the public and indicates its power as the authority through threats and scare tactics. It places responsibility of avoiding Day Zero in the hands of the public. Accordingly, the City must therefore fight the public in order to win the war against the drought. None of the City's communications in the data set said that the situation is out of control, but it was implied that without drastic drops in consumption the future could become unpredictable and precarious. According to this frame it was largely up to the public to change their consumption behaviour to avoid this. The excuses and challenges expressed by the City, whether real or imagined, worked to reduce the responsibility of the City's response to the crisis. Interestingly, this view is also reflected in the City's pre-drought position, when De Lille and Kesson (2017), note some high-consumption residents lack of regard for conserving water. According to Laws and Rein (2003), an effective frame should among other things ensure the lived experience of the public is not threatened to such an extent that it becomes impossible for the public to concede the message the frame

conveys. This frame contradicts this principle in that the frame does threaten the sense of future security in the collective mind of the public. Perhaps this is why this frame was not utilised as frequently as others. This frame is the least occurring frame in stream A and does not occur at all in stream B. While scare tactics may seem to be strong drivers in motivating behaviour change, it is possible that these worked to the contrary, making the public shut-off from the underlying agenda which was essentially to encourage behaviour change and consumption reduction, albeit in a harsh manner. However, it is also true that the more the public perceived the situation as being high risk, the more likely they were to change their behaviour (Liang et al., 2018). Nevertheless, this frame was neither reassuring nor encouraging for the public.

6.3 The temporal trends in the two streams of the City's communications

This section deals with the temporal shifts of the frames for each stream in relation to the state of the drought. Essentially, it attempts to tell the story of the water shortage over time using the frames previously identified as a lens to analyse how the situation was being interpreted by the City and presented to the public through communication items made available online.

6.3.1 The build up

Although there had been prior warnings and cause for concern, officially, the water shortage crisis began on the 29th of March 2017, when Cape Town was declared a local disaster area (Ziervogel, 2019). The announcement was made in an official statement (stream A) by the Mayor, within which she stated, "*I have given an instruction that we simply must do everything we can to start implementing these new schemes in the current financial year already and find the budget to do so in order to augment our water supplies as soon as possible*" (City of Cape Town, 2017y). The frames used in this statement were 'the City success story' and 'the situation is controllable', with the City focusing on managing the situation via technical solutions in order to ensure normal urban functioning continues. It is plausible that on some level there was still a sense that the winter of 2017 would bring enough rain to replenish the supply dams.

The City's communications in the following month, April 2017, expressed no major reference to the water situation. Only a single statement (stream A) in the data set mentioned the drought in passing when speaking about national soccer and the need for collaboration for water-wise management of sport fields (City of Cape Town, 2017z). The notable absence is interesting considering the fact that a disaster had just been declared. However, it is worth noting that at this point the 'consumption is key' frame enters the narrative, reflecting the City's concern for water-use reductions. The City also released a series of photos (stream B) of the WCWSS at this time (City of Cape Town, 2017v; City of Cape Town, 2017w; City of Cape Town,

2017x; City of Cape Town, 2017y). The photos depict low levels of water in the supply dams but offer little other information or actionable advice. This ambiguity employs the 'obscurity and ambiguity' frame and reflects that the City was unclear and unsure about the nature of the situation, the future scenarios associated therewith and the ideal course of action to take at this time.

May of 2017 did not see more communications than the previous months, however, a slight sense of urgency entered the narrative. At this time, the term Day Zero begins to be used, although the City are not entirely comfortable with the lack of surety it implies (Ziervogel, 2019). While May marked the start of the rainy season for Cape Town, there was a growing concern within the City regarding the precariousness of the situation. A Water Resilience Task Team [WRTT] was established to provide a Water Resilience Plan which was to answer to worst case scenarios for how the water shortage might play out and what the City would have to do in order to manage the situation (Robins, 2019). It was implied that the future of water security in Cape Town was undergoing a shift; in a statement (stream A), the mayor stated that "*this is going to become the new normal for Cape Town*" (City of Cape Town, 2017aa). Continuing from the previous months, the frames that appear are 'consumption is key' and 'the situation is controllable'. The 'together we can beat the drought' frame also enters the narrative as the City starts to urge the public to make changes in their own water behaviour.

The following two months are relatively quiet in terms of communications released by the City. In June 2017, level 4 water restrictions were implemented (Ziervogel, 2019) but no official communications were released (at least according to the data set). In July, a few more photos (stream B) of arid supply dams are made available (City of Cape Town, 2017p; City of Cape Town, 2017q). Once again, these trigger the 'obscurity and ambiguity' frame because they provide some visual data but remain ambiguous and do not offer insight about how the public should interpret or act upon them. There is also a statement (stream A) released which continues to follow the trend of the prior months by promoting the 'consumption is key' and 'the situation is controllable' frames.

In August of 2017, the situation starts to become alarming, with the City putting out drought-related statements more frequently and drawing on nearly all identified frames. These statements talk about the installation of water management devices at high consumption households, procuring necessary technologies for planned augmentation schemes (desalination, water reuse, groundwater extraction) and there are multiple references to the need to become more resilient (City of Cape Town, 2017ac; City of Cape Town, 2017ad; City of Cape Town, 2017ae). The tone is slightly desperate at times with the Mayor saying, "*as we prepare for the hot summer months ahead, it is imperative that the consumption does not*

spike" (City of Cape Town, 2017ad). The City also became more threatening, with statements like, "*we will now forcibly restrict those households who continue to contravene water restrictions*" (City of Cape Town, 2017ac). There were no stream B items – i.e. educational materials – released in August.

September 2017 was considerably quieter with only a single statement coming from the City relating to the water shortage. However, this is not to say that the City was inactive in their drought management at this time. At this point, level 5 water restrictions were implemented (Ziervogel, 2019). In the statement there was a strong appeal made to the commercial sector to reduce water. It also included links to the ThinkWater website and water calculator, as well as an email address for queries, which were intentionally set up to help facilitate water-use reductions amongst the public (City of Cape Town, 2017af). The frames that appeared at this time were 'consumption is key', 'the situation is controllable' and 'together we can beat the drought', which indicates that the City was following on previous months in their focus on private water consumption behaviour. As was the case in August, there were no stream B items released in September.

6.3.2 Crisis climax

Approaching the end of the rainy season, which proved to be another dry winter, it became clear that the City lacked a contingency plan to deal with a crisis of this magnitude. In October 2017, the City took more active measures to mitigate the drought. The Mayor assembled a special task team and held daily meetings for ongoing monitoring and a quicker response time (Ziervogel, 2019). As a result of the daily meetings and reshuffling of water management, this high-level task team took on the primary responsibility of the drought response campaign, a role usually associated with the internal WSD (Ziervogel, 2019). As part of the task team, the external communications firm known as Resolve was brought in to manage public communications. The results showed no evidence that the crisis was reframed with Resolve's input, however, all the frames were utilised and the frequency for all frames increased. At this time, the City stated their "*...commitment ... to communicate directly with all Capetonians*" and to "*make the dam levels and consumption data available on a daily basis*" (City of Cape Town, 2017ai). More educational and instructional items of communication associated with stream B began to be distributed as the Day Zero campaign was put into action. The City released a poster for finding and fixing leaks (City of Cape Town, 2017f), a presentation about the Critical Water Shortage Disaster Plan (City of Cape Town, 2017b), a Level 5 restrictions infographic (City of Cape Town, 2017h), a water saving checklist (City of Cape Town, 2017t), another leaks guide (City of Cape Town, 2017e) and a banner (City of Cape Town, 2017a). As a result of the influx of items, 'the City success story', 'consumption is key', 'the situation is controllable' and 'together we can beat the drought' frames began to appear in stream B, with the key focus being on reducing private water consumption and encouraging responsible water-use, a sentiment captured in the information

guide about leaks which stated, "*the more you save, the less you pay – and more water remains in our dams*" (City of Cape Town, 2017t). There were also multiple statements released by the Mayor and her team which dealt with the water situation, including the expectations of the business sector, the plans for augmentation schemes and public communication (City of Cape Town, 2017ag; City of Cape Town, 2017ah; City of Cape Town, 2017ai). The City utilised multiple frames including 'obscurity and ambiguity', 'consumption is key', 'the situation is controllable' and 'together we can beat the drought'. However, notably 'the City success story' was the frame used most, which indicates the City's desire to appear as the protagonist in their narrative, with the Mayor stating in many variations, that they "*want to assure residents again that we [the City] will not allow a well-run city to run out of water and this will be achieved through progressive savings and out [the City's] multi-layered augmentation plan to build water resilience*" (City of Cape Town, 2017ah) and "*the City has always been a very responsible player in the Western Cape Water Supply System*" (City of Cape Town, 2017c). They also released a public summary which described the Critical Water Shortage Plan and declared Cape Town to be in stage one of disaster management (City of Cape Town, 2017c). The WCWSS closed the rainy season on October 31st with 344 657 million litres in supply (just over a third of the systems' capacity), which signalled extreme concern, as it meant there was no way the City could ensure usual levels of supply until the following winter (CSAG, 2019).

In November 2017, the City was in full-blown response mode with 10 statements being released by the Mayor in one month. Contents of these items ranged from state borehole/spring refurbishment (City of Cape Town, 2017aj; City of Cape Town, 2017ak), the matter of evaporation (City of Cape Town, 2017am), assessing unused city pipelines (City of Cape Town, 2017al), potentially removing alien vegetation in catchment areas (City of Cape Town, 2017an), surveying for additional aquifer sites (City of Cape Town, 2017ap; City of Cape Town, 2017ar), and the alarming spike in consumption, which was partially off-set by unusual summer rainfall (City of Cape Town, 2017as). There was also a statement which offered more comprehensive information regarding the weekly water dashboard (City of Cape Town, 2017aq). Every one of the six frames was identifiable in stream A items in November, possibly due to the high volume of items released at this time. The increase in communications was likely due to the contributing efforts of the external communications group, Resolve, though it is difficult to distinguish this with certainty as communications were ultimately released under the umbrella of the City. At this point, the term Day Zero was officially adopted for the water crisis (Ziervogel, 2019). For this reason, the City also released a statement which outlined the meaning of Day Zero and when and how it would likely play out. The City stated that "*Day Zero can be avoided. Capetonians have done amazing work to save water. Most residents are saving water but we need every single person to use the prescribed 87 litres per person per day. If we don't have everyone restricting their water consumption, we will reach Day Zero in May*" (City of Cape

Town, 2017ao). It is worth noting that the frame with the highest count for this particularly active month was 'the City success story' frame which indicates that the City was invested in the idea that they were capable of managing the situation. Stream B items for November included a poster-style announcement of rationing through pressure management to extend supply (City of Cape Town, 2017r), a water saving plumbing checklist (City of Cape Town, 2017u), and a poster for a 'permission cubicle' which promoted a social agreement of minimal flushing in shared bathrooms (City of Cape Town, 2017i). All of these items triggered the 'consumption is key', 'the situation is controllable' and 'together we can beat the drought' frames, once again showing the strong focus on reducing private consumption as the key factor for controlling the situation.

Going into December 2017, water levels were at a critical point. Stream A items reiterated the installation of water management devices (City of Cape Town, 2017at), water rationing (City of Cape Town, 2017j) and pressure reduction (City of Cape Town, 2017s). Given the exacerbating effects of summer, the City also pleaded with the public to reduce consumption, stating, "*we appeal to residents to please step up their water-saving efforts as we can only get through this together*" (City of Cape Town, 2017au). At this time the City adopted a more aggressive approach to "forcibly lower water usage" (City of Cape Town, 2017j) and restrict "*delinquent users*" (City of Cape Town, 2017at). All but one of the frames appear in stream A items in December, the exception being 'the situation is controllable', which the City stopped using for stream A items. At no point does the City say the situation is out of control but there is simply no mention made as to whether the situation was or was not controllable, suggesting their uncertainty regarding the situation. For stream B items, December saw the launch of the 'save like a local' campaign which specifically targeted the influx of tourists in Cape Town over the holiday season. This included a pamphlet, poster, door hanger and tent card, as well as banners set up at strategic places around the city (City of Cape Town, 2017k; City of Cape Town, 2017l; City of Cape Town, 2017m; City of Cape Town, 2017n). The main message of these items was to make visitors aware of the severe drought Cape Town was experiencing and to offer simple water saving advice, telling people to "*wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers [and] don't leave the tap running while brushing teeth*" (City of Cape Town, 2017k; City of Cape Town, 2017l; City of Cape Town, 2017m; City of Cape Town, 2017n). Additionally, an information guide about pressure management was released at this time (City of Cape Town, 2017g). The City also published a series of posters with portraits of individual residents and overlaying text statements about why these individuals were taking measures in their own lives to save water (City of Cape Town, 2017d). As with the previous month, the frames that dominated in stream B in December 2017 were 'consumption is key', 'the situation is controllable' and 'together we can beat the drought', as the City aimed to encourage non-abiding Cape Town residents and visitors alike to

not only be aware of the crisis but also to adopt measures to reduce their water use.

6.3.3 New year, new normal

The uncertainty of the water shortage continued into the new year of 2018, with level 6 water restrictions being implemented on the 1st of January 2018 (Ziervogel, 2019). The statements from the City at this time dealt with ground water abstraction (City of Cape Town, 2018f; City of Cape Town, 2018g) and the proposed drought charge (City of Cape Town, 2018h), which was soon dropped (City of Cape Town, 2018j). Following on December, the City used all frames with the exception of 'the situation is controllable'. Interestingly, no stream B items were released in January, during the peak of the crisis. Perhaps all advice and suggestions for water behaviour amongst the public had already been communicated in previous items, or perhaps the City were utilising other platforms for communication which were not included on their website and therefore not reflected in this study. Nevertheless, the idiosyncrasy is notable simply because it was at this point that level 6 water restrictions were implemented, which had high expectations of the public for limiting water usage, and therefore higher frequency of items would be expected.

Despite an unmet request from the Western Cape Province in 2015 for National Disaster Risk Management to declare a disaster (albeit in the early stages), the drought was finally declared a national disaster affecting three provinces in February 2018 (Ziervogel, 2019). And yet despite concerns being high, the data from this study found communications to the Cape Town public by the City to be relatively few in February 2018.[32] The only stream A item was an annexure (relating to an item from October 2017) containing some information about the City's Critical Water Shortage Plan (City of Cape Town, 2018c). At this point the only frames that the City were engaging were 'the City success story' and 'obscurity and ambiguity', with statements like "*a water augmentation plan is designed to protect existing water rights by diversifying supply from reliance on groundwater to other sources*" (City of Cape Town, 2018c), which continues to centralise the City's role as capable management and sounds promising but is rather open-ended. In stream B, the City released a guide for reading water meters and water management devices in their continued effort to engage residents to be conservative in their water usage, and to be vigilant of leaks (City of Cape Town, 2018d). The City also released a PowerPoint presentation of the water outlook at the time, with an overview of dams, consumption, augmentation and other measures implemented for water reduction, and cost recovery (City of Cape Town, 2018e). At this time, the City released an interesting newsletter, titled 'City News, Issue 44: Day Zero Residents Newsletter', which featured short articles, colourful infographics,

[32] Once again, it is worth noting that it is possible that the City may have been using other methods to communicate with the public other than the data provided online.

pictures, and catchy phrases all relating to the Cape Town water shortage (City of Cape Town, 2018a). It included information covered in many of the previous items but was delivered to the public in a more digestible, accessible and stimulating manner. It summarised the drought situation, dam levels, pressure reduction and tariff increases, and it emphasised the threat of reaching Day Zero, and how to effectively utilise 50 litres of water per person daily (City of Cape Town, 2018a). It also dealt with other matters relating to water such as health threats, plastic bottle recycling and augmentation plans (City of Cape Town, 2018a). Collectively, the stream B items used all frames except 'us versus them', although the diverse range of contents included in the newsletter triggered a wide range of the frames coming into use at this point.

In March of 2018, City communications were rather quiet. Only one stream A item was released which provided information about using seawater for flushing and filling pools, which the City stressed was not ideal because, "*the chemical compounds found in seawater are known to interfere with the biological treatment processes that occur at the treatment plants. For the reasons above, the use of seawater for flushing toilets and for topping up conventional swimming pools is not envisaged in the long term*" (City of Cape Town, 2018b). It was necessary for the City to address this because seawater was suggested as being ideal for non-potable water use due to it being so widely available in the Cape Town area. At this time, the only frame triggered was 'obscurity and ambiguity' because the problem is presented as complex and solutions not entirely clear. In line with the low communications count in stream A, there were no stream B items released in March. Nevertheless, due to a massive reduction in private consumption through behavioural interventions and pressure management amongst other ventures, Day Zero was officially delayed to 2019 in March (Robins, 2019). This marked a break from the year long crisis. While this was a massive relief for the City and Cape Town residents alike, restrictions were not lifted until 2018's winter rains had sufficiently refilled the supply dams.

6.4 City communications – a clear strategic narrative or the product of a less systematic process?

This final section explores how the City relayed the drought narrative to the public and whether this process was coherent and organised, or more contrary and capricious. It also considers the effectiveness of the City's communications. According to Entman (2007), a fully formed frame provides answers to the public regarding where responsibility lies, who is entitled to what, and it normalises certain narratives. The City's response drew on six dominant frames, which were not mutually exclusive. Each frame was fully formed and there was not one single frame which dominated the narrative in the case of Cape Town's water crisis. While each frame provided a structure for understanding the water shortage crisis and there were overlaps between the frames regarding certain aspects, there were also idiosyncrasies and contradictions (around the

same time period and even within single items of communication). This section explores whether this was problematic. While it is logical to think that conflicting messages detract from the overall objectives of the authority, it is also plausible that contrary to this the variety of frames made it possible for messages to resonate with different audiences for a wider range of public responses – both positive and negative.

6.4.1 Strong frames and overlapping aspects

Amongst the City's communication items were notable frames with high prevalence and certain aspects which overlapped; these repetitions imply particularly important aspects for the City when defining the crisis. The strong frames were those which resonated with the City in their desired drought narrative (Chong & Drukman, 2007). The overlap of the frames 'consumption is key' and 'the situation is controllable' highlight how the City centred their drought-relief efforts on consumption reduction and how they emphasised their own ability to maintain control over the situation. Together, these strong frames in both streams worked to offer comfort and stability to the public who relied on the City to ensure the supply of water, while also urging them to adopt water-saving changes in their personal behaviour. It is not surprising that in the positioning/status stream A, there was also a strong push for 'the City success story', which is indicative of the City's self-promoting agenda, naturally tied to their need to be identified as a managing authority capable of handling any crisis threatening the daily functioning of the city which they are responsible for. Similarly, it makes sense that in the educational/instructional stream B, the 'together we can beat the drought' frame was used frequently, together with 'consumption is key' and 'the situation is controllable'. This combination of strong frames in stream B not only encouraged the people of Cape Town to actively participate in water-saving efforts, but that this cooperation and joint effort was critical for avoiding Day Zero.

6.4.2 Frame pluralism, ambiguity and contradictions

In contrast to the strong and overlapping frames were the ambiguous, contradictory and plural frames, which illustrated deficits and a lack of coherence in the City's communications responses. Ambiguous framing is considered problematic because it may lead to fragmentation in policy and management (Hurlbert & Gupta, 2016). One of the areas of ambiguity was the temporal extent of the crisis. A crisis is usually implied to be temporary and in the build-up phase (March 2017 – September 2017) it was often implied to be so; for example, in August 2017 it was announced that "*the City has no plans to perform localised water-shedding*" (City of Cape Town, 2017ad). However, in the crisis climax phase (October 2017 – December 2017) this shifted with the 'new normal' narrative, implying long-term potential effects, with the Mayor stating in November 2017 that, "*if we don't have everyone restricting their water consumption, we will reach Day Zero in May*" (City of Cape Town, 2017ao). The most notable

contradiction amongst the City's six dominant frames was 'us versus them' which went against the messages of 'the situation is controllable' and 'together we can beat the drought' frames, in that it largely implied the situation was the consequence of a delinquent public, making it no longer possible for the City to ensure a secure future for Cape Town's residents. Interestingly, 'us versus them' was the least occurring frame in stream A and did not appear at all in stream B. There may have been reason to feel that the public were slow to respond and not concerned enough to cooperate from the City's perspective, and therefore scare tactics and disciplinary interventions could have been justified for shocking the public into action. However the lack of appearance of this frame is not entirely surprising as, the low frequency of this frame occurring suggests that when the City adopted a condescending, judgmental and passive-aggressive approach, it may have prompted apathetic and even defiant responses from people, which would be counterproductive for the City's intentions to catalyse action from the public. As the crisis heightened, the public became frustrated and began demanding answers which this frame could not provide (Robins, 2019). It is suggested here that the negative public response towards the City's handling of the water crisis was in large part due to this particular idiosyncrasy which essentially and unfairly shifted responsibility on the public. Although this was overall the least used frame, the total non-occurrence in stream B also indicates the different approaches taken in different media formats, with the nature of stream B items being more educational and therefore using less pejorative language, and more neutral or positive terms, offering advice and practical actions.

6.4.3 Height of crisis and climax of City response

The City was slow to respond to the early warning signs of a drought most probably because the threats were less perceptible in the early stages (2015 and 2016) and the presumption – based on the high level of assurance for the WCWSS – was that winter rains in 2017 would replenish supply dams (Wolski, 2018). However, this changed when the City was declared a disaster area in March 2017, implying an increased need to communicate the situation to the public. Overall, items released in stream A were more varied and spread out, reflecting general City operations and an ongoing process of communicating and justifying City activity to the public. Whereas stream B items were more concentrated around the height of the crisis,[33] with high volumes of items being released in October, November and December of 2017.[34] However, stream A also saw an increase in the volume of items released between October 2017 and January 2018.[35] Together, the hike in communications correlates with the peak of the crisis when the threat of Day Zero

[33] While it may have been plausible to expect more educational items when considering public communications, it is not surprising that these stream B items only really entered the story around the peak of the crisis.
[34] Stream B had the highest overall items occurring in December 2017.
[35] Stream A had the highest overall items occurring in November 2017.

intensified. This trend is reflective of the heavily reactive nature of the City's response communications with the public, a trend observed in many urban crisis responses around the world (Wilhite et al., 2014). Stream A frames were more varied than stream B. This could simply be the result of a higher number of items being released in stream A over the crisis period. However, it is more likely that this is due to the City having to address more nuances in their positioning/status items, whereas the educational/instructional items are more focused on providing simple, actionable information.

6.4.4 Heterogeneity as a strength

In many ways, the City's public communications response during the water shortage crisis suggests that the City was not prepared for a crisis of this scale and that the drought response was largely reactive, symptom-orientation, and not always coherent. However, despite the contradictions, ambiguity and lack of clear strategies and contingency plans, water consumption was reduced by 43% compared with pre-drought consumption levels (City of Cape Town, 2019b). Furthermore, it was largely due to the massive reductions in consumption that the WCWSS dams did not run lower than 13,5% and Cape Town circumvented Day Zero actualising. By this measure, the City was successful in reaching their ultimate objective of avoiding a full-blown crisis where Cape Town's water supply would be shut-off. It may be true that the City's communications were unidirectional and did not make space for a back-and-forth engagement with the public, especially in 'the City success story' frame which was neither collaborative nor encouraging. However, participatory approaches may have been difficult considering the time sensitivity around responding to the crisis (although this may have been better navigated with better contingency planning beforehand). Nevertheless, a strong focus on unidirectional and unidimensional communication interventions by authorities responsible for managing a crisis is problematic because it fails to account for the multidimensional complexities associated with the reality of a drought (Neto, 2016). The same crisis can be understood and experienced from many different perspectives and a heterogenous range of frames can therefore be effective in targeting multiple audiences or different levels of behaviour change. For this reason, successful campaigns often do consist of multiple approaches, possibly with some more intentional than others, and these strategies work in combination to reach a diverse public audience (Liang et al., 2018). The coexistence of multiple frames can lead to frame pluralism, contradictions, and a failure of frames to fully offer meaning, which can make decision-making difficult (Laws & Rein, 2003). While this may be true, especially for decision processes, it is also true that single frames can limit drought responses (Vogel & Olivier, 2018). While the City received a fair share of criticism for their drought response communications (Robins, 2019), it is plausible to think that the heterogeneity of messages in the City's communication responses facilitated a wider range of audiences and responses. The City's approach was therefore arguably successful albeit contentious.

Chapter 7

Conclusion

Given the inter-reliant relationship between the City and the public for managing water as a resource, it is important for managing authorities to be aware of their position of power and to act responsibly in how they communicate with the public. This research project analysed how the City of Cape Town framed the water crisis (03/2017 – 03/2018) in their official communications made available online to the public, with the motivation being to contribute to a better understanding of the role of public communications by city municipalities in water crisis management. The project drew on literature on framing as well as water crisis management in order to unpack the ways in which framing in communications by authorities influences how information is presented to the public and how experiences are subsequently understood. The project had three key objectives: to determine the types and characteristics of communication items released by the City during the recent water crisis; to determine a range of frames employed by the City in communicating the drought; and to analyse trends in the framing of the water crisis messages to identify whether there were shifts in framing and messaging throughout the water crisis response period.

In times of extreme water shortage, one of the most effective short-term interventions for reducing consumption is to target public behaviour through public communications campaigns (Dolnicar et al., 2012). This was also true for Cape Town. In the former Mayor's co-authored book released in 2017, water charges and pressure reduction are mentioned for water management but public communications and behavioural changes are emphasized as critical for managing a water crisis (De Lille & Kesson, 2017). In response to the threat of Day Zero, the City attempted to prompt behaviour change by communicating messages relating to water availability, restrictions, City mitigation efforts, and general awareness of non-wasteful water behaviour. The City was successful in avoiding Day Zero, however, relying so heavily on public action to avoid a total shut-down was high-risk because it may have been received reluctantly or dismissed. For this reason, there is a need for better planning and more resilient infrastructure. Nevertheless, the massive cut in consumption in Cape Town exemplified a city's ability to conserve large amounts of water when necessary.

The study used an abductive approach to analyse data. This allowed deductive aspects from literature on water crisis management and framing theory to shape and guide the project, while also making space for framing aspects to be identified inductively through analysing the data. This combination took into account wider knowledge on the subject while also concentrating on details from the data itself and led to a total set of key frames specific to the study. Through the analysis process two streams of communications types were found; stream A consisted of positioning/status items and stream B consisted of instructional/educational items. Six key frames were identified in the City's communications over the crisis period, namely: 'the City success story'; 'obscurity and ambiguity'; 'consumption is key'; 'the situation is controllable'; 'together we can beat the drought'; and 'us versus them'. For both streams, a strong overlap was found between the 'consumption is key' and 'the situation is controllable' frames which appeared in many items together, indicative of the City's focus on private consumption reduction to avoid Day Zero while promoting their ability to manage the situation and maintain control over the crisis. In stream A, 'the City success story' also appeared often, highlighting the City's self-promoting agenda to maintain their identity as a capable authority. In stream B, another frame which appeared frequently was 'together we can beat the drought', which promoted the idea that cooperation and collective effort amongst Cape Town water users was critical for avoiding Day Zero. The least used frame was also central to the most strikingly contradictory message to come out of the City during the crisis period; 'us versus them' went against the messages of 'the situation is controllable' and 'together we can beat the drought' frames and suggested that the actualisation of Day Zero would be the result of Cape Town's misbehaving public, whose lack of cooperation made it impossible for the City to maintain control over the situation. The harsh and unfair pinning of responsibility on the public may have been the reason for some of the negative public response towards the City's handling of the water crisis.

Frames in stream A were found to be more varied than in stream B, which may be the result of increased nuance in stream A content and a more focused instructional value in stream B. For both streams however, the increase in communications coincided with the climax of the crisis, reflecting the global trend of reactive, symptom-orientated drought response by the City (Wilhite et al., 2014). Yet despite the contradictions, ambiguity and lack of clear strategy or contingency planning, water consumption was reduced by 43% compared with pre-drought consumption levels in Cape Town (City of Cape Town, 2019b).

Despite being criticised for being unidirectional and non-participatory (Robins, 2019), the City was ultimately successful in reaching their objective of avoiding Day Zero. The frames analysis showed that the City was less strategic in their communications than they might have liked. However, the study found that despite idiosyncrasies, contradictions and lack of strategy, the City's body of public communications

resulted in a heterogenous range of frames which were successful in prompting the public to reduce water consumption and thereby delaying and ultimately circumventing Day Zero. The project found that the same crisis can be understood and experienced from a multiplicity of differing perspectives and it can be argued that the homogeneous range of frames effectively helped to target multiple audiences and different levels of behaviour change. Nevertheless, while communication campaigns that push behaviour change have been proven to be effective short-term solutions to water crisis (Turner et al., 2016; Buurman, Mens & Dahm, 2017) and while the City may have successfully navigated the Day Zero crisis, this is not an ideal model for water crisis management, especially considering the increased weather variability due to climate change. Reactive communications are therefore not a panacea for drought relief, and it should not be the primary solution for managing authorities facing water shortage crises.

The City played a central role in producing the dominant frames, situating meaning and facilitating the public's understanding of the problems and solutions. Understanding how the City exerted its power and set up the framing of the crisis is therefore necessary for understanding the unfolding of the water crisis. The precarious nature of Cape Town's water shortage highlighted that the City, like many others around the world, did not have an adequate contingency plan in place to handle a crisis of this nature (Ziervogel, 2019) and magnitude. This is most likely because it had never been faced with such a crisis and up until this point, infrastructure and management for provisioning water had been sufficient to meet demand. Increasing variability due to climate change leaves many urban areas vulnerable to weather-related crisis. Unfortunately, insufficient policy and provision for crises have resulted in water crisis management which is largely reactive, symptom-oriented, and crisis-centred, despite the increasing concern regarding climate change, weather variability, and the associated threats for resources such as water (Wilhite et al., 2014).

The study highlighted the interconnectedness between communication, knowledge and behaviour, and that understanding how a crisis is framed is important for understanding how public perceptions and reactions are influenced by authorities' messaging. Further research into framing in public communications during crisis management periods is useful for investigating effective interventions for crisis management and also for understanding public-government dynamics. This project was limited to analysing communications made available online by the City and only investigated frames from the City's unidirectional flow of communication in the form of official communication items released to the public. Nevertheless, it was able to highlight the dynamic interplay between a managing authority and the public through communications. There is potential to research framing in the more complex back-and-forth engagement between multiple stakeholders and the City during the water crisis. Similarly, there is potential to conduct larger comparative studies of public communication strategies by different urban municipalities responding

to water shortage crises around the world. Given the increased likelihood of extreme weather events related to climate change and the potential crises it poses for human settlements around the world, it is useful to consider communications and framing between authorities responsible for managing a crisis and the public for whom they are responsible for, and whose behaviour directly affects their ability to manage a crisis effectively.

References

Ardèvol-Abreu, A. 2015. Framing theory in communication research in Spain. Origins, development and current situation. *Revista Latina de Comunicación Social.* 70:423-450.

Buurman, J., Mens, M., & Dahm, R. 2017. Strategies for urban drought risk management: a comparison of 10 large cities. *International Journal of Water Resources Development.* 33(1):31-50.

Chong, D. & Druckman, J. N. 2007. Framing theory. *Annual Review of Political Science.* 10(1):103-26.

City of Cape Town. 2017a. *Banner - Lets save, Cape Town! Together.* Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017b. *Critical Water Shortages Disaster Plan presentation* [PowerPoint]. Available at: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017c. *Critical Water Shortages Disaster Plan Summary.* Available: http://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Critical%20Water%20Shortages%20Disaster%20Plan%20Summary.pdf [2019, June 9].

City of Cape Town. 2017d. *CoCT Save like a local Residents Flags* [Poster]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017e. *DIY Find and Fix Water Leaks Guide.* Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017f. *Find and Fix Leaks* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017g. *Guide on Water Rationing A4 Poster* [Poster]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017h. *Level 5 Water Restrictions Infographic* [PowerPoint]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017i. *Permission cubicle A4 Poster English* [Poster]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017j. *Pressure Reduction Guideline Summary* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Procedures,%20guidelines%20and%20regulations/Water%20rationing_how%20it%20works.pdf [2019, June 9].

City of Cape Town. 2017k. *Save Like a Local Tourist Campaign- Door Hanger- Poster* [Poster]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Graphics%20and%20educational%20material/CoCT%20Water%20Tourist%20Campaign%20Door%20Hanger%20FA.pdf [2019, June 9].

City of Cape Town. 2017l. *Save Like a Local Tourist Campaign- Pamphlet* [Pamphlet]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Graphics%20and%20educational%20material/CoCT%20Water%20Tourist%20Campaign%20DL%20leaflet%20FA.pdf [2019, June 9].

City of Cape Town. 2017m. *Save Like a Local Tourist Campaign- Poster* [Poster]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Graphics%20and%20educational%20material/CoCT%20Water%20Tourist%20Campaign%20A2%20Poster%20FA.pdf [2019, June 9].

City of Cape Town. 2017n. *Save Like a Local Tourist Campaign- Tent Card- Poster* [Poster]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Graphics%20and%20educational%20material/CoCT%20Water%20Tourist%20Campaign%20Tent%20card%20FA.pdf [2019, June 9].

City of Cape Town. 2017o. *Steenbras-May 2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017p. *Theewaterskloof-Jul2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017q. *Theewaterskloof-2-Jul2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017r. *Water Rationing A4 poster* [Poster]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017s. *Water Rationing Dos and Don'ts Guideline* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Procedures,%20guidelines%20and%20regulations/Water%20Rationing_DosandDonts.pdf [2019, June 9].

City of Cape Town. 2017t. *Water Saving Checklist.* Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017u. *Water saving plumbing checklist.* Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017v. *Wemmershoek-1-2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017w. *Wemmershoek-2-2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017x. *Wemmershoek-3-2017* [Photograph]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2017y. *29 March 2017: Executive Mayor's Full Council Meeting Speech* [Speech]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/SPEECH%20BY%20EXECUTIVE%20MAYOR%20AT%20THE%20FULL%20COUNCIL%20MEETING%2029%20MARCH%202017.pdf [2019, June 9].

City of Cape Town. 2017z. *26 April 2017: Executive Mayor's Full Council Meeting Speech* [Speech]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/SPEECH%20BY%20EXECUTIVE%20MAYOR%20AT%20THE%20FULL%20COUNCIL%20MEETING%2026%20APRIL%202017.pdf [2019, June 9].

City of Cape Town. 2017aa. *30 May 2017: Executive Mayor's Budget Speech* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/Budget%20Speech%20by%20Executive%20Mayor%2030%20May%202017.pdf [2019, June 9].

City of Cape Town. 2017ab. *27 July 2017: Executive Mayor's Full Council Meeting Speech* [Speech]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/SPEECH%20BY%20EXECUTIVE%20MAYOR%20AT%20THE%20FULL%20COUNCIL%20MEETING%2027%20JULY%202017.pdf [2019, June 9].

City of Cape Town. 2017ac. *16 August 2017: Executive Mayor's Statement - High Consumption Households* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/16%20Aug%2017%20high%20consumption%20households.pdf [2019, June 9].

City of Cape Town. 2017ad. *17 August 2017: Executive Mayor's Statement - Advancing Water Resilience* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/17%20Aug%2017%20Advancing%20water%20resilience.pdf [2019, June 9].

City of Cape Town. 2017ae. *23 August 2017: Executive Mayor's Statement- Grant Towards Drought Relief* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/23%20Aug%2017%20grant%20towards%20drought%20relief.pdf [2019, June 9].

City of Cape Town. 2017af. *3 September 2017: Executive Mayor's Statement* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/3%20Sep%2017%20Driving%20water%20consumption.pdf [2019, June 9].

City of Cape Town. 2017ag. *19 October 2017: Executive Mayor's Statement- City Hosts 600 Business Sector Representatives* [Statement]. Available:

http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/19%20October%20City%20hosts%20close%20to%20600%20business%20sector%20representatives.pdf [2019, June 9].

City of Cape Town. 2017ah. *26 October 2017: Executive Mayor's Full Council Meeting Speech* [Speech]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/SPEECH%20BY%20EXECUTIVE%20MAYOR%20AT%20THE%20FULL%20COUNCIL%20MEETING%2026%20OCT%202017.pdf [2019, June 9].

City of Cape Town. 2017ai. *30 October 2017: Executive Mayor's Statement - Drought crisis: moving forward together* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/30%20October%20Drought%20crisis%20moving%20forward%20together.pdf [2019, June 9].

City of Cape Town. 2017aj. *2 November 2017: Refurbished Atlantis Aquifer Executive Mayor's Speech* [Speech]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/Speech%20by%20Mayor%20De%20Lille%20Refurbished%20Atlantis%20Aquifer.pdf [2019, June 9].

City of Cape Town. 2017ak. *8 November 2017: Executive Mayor's Statement - City commissions project to bring additional drinking water online from springs and Molteno Reservoir* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/8%20November%20project_%20additional%20drinking.pdf [2019, June 9].

City of Cape Town. 2017al. *9 November 2017: Executive Mayor's Statement - City pipeline assessment* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/9%20November%20City%20pipeline%20assessment.pdf [2019, June 9].

City of Cape Town. 2017am. *13 November 2017: Executive Mayor's Statement - Bad Weather Leads To Decline in Dam Levels* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/13%20November%20%20weather%20leads%20to%20decline%20in%20dam%20levels%201.pdf [2019, June 9].

City of Cape Town. 2017an. *15 November 2017: Executive Mayor's Statement - Removal Of Alien Vegetation at Wemmershoek Dam* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/15%20November%20Removal%20of%20alien%20vegetation%20at%20Wemmershoek%20Dam%20will%20help%20City%20save%20water%20and%20stretch%20supply.pdf [2019, June 9].

City of Cape Town. 2017ao. *16 November 2017: Day Zero: when is it, what is it, and how can we avoid it?* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/16%20November%20Day%20Zero%20when%20is%20it%20what%20is%20it%20and%20how%20can%20we%20avoid%20it.pdf. [2018, October 12].

City of Cape Town. 2017ap. *19 November 2017: Executive Mayor's Statement- Exploratory Work At Steenbras* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/19%20Nov

ember%20EXPLORATORY%20WORK%20AT%20STEENBRAS%20OF%20TABLE%20MOUNTAN%20GROUP%20AQUIFER%20IS%20PROGRESSING%20WELL.pdf [2018, October 12].

City of Cape Town. 2017aq. *23 November 2017: Executive Mayor's Statement- City Launches Weekly Water Dashboard* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/23%20November%20City%20launches%20new%20weekly%20water%20dashboard%20to%20track%20supply,%20savings%20and%20Day%20Zero.pdf [2018, October 12].

City of Cape Town. 2017ar. *26 November 2017: Executive Mayor's Statement- Aerial Mapping Of The Cape Flats Aquifier [sic]* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/26%20Nov%2017%20Aerial%20mapping%20of%20the%20Cape%20Flats%20Aquifer.pdf [2018, October 12].

City of Cape Town. 2017as. *28 November 2017: Executive Mayor's Statement- Weekly Dashboard* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/28%20Nov%2017%20Weekly%20dashboard.pdf [2018, October 12].

City of Cape Town. 2017at. *3 December 2017, Executive Mayor's Statement: Day Zero* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/3%20December%2017%20Cape%20Town%20will%20reach%20Day%20Zero.pdf [2019, June 9].

City of Cape Town. 2017au. *12 December 2017: Executive Mayor's Statement- Water Dashboard Reveals Alarming High Consumption Trend* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/12%20December%2017%20Water%20dashboard%20reveals%20alarming%20high%20consumption%20trend.pdf [2019, June 9].

City of Cape Town. 2018a. *City News, Issue 44: Day Zero Residents Newsletter.* Available: http://resource.capetown.gov.za/documentcentre/Documents/Forms,%20notices,%20tariffs%20and%20lists/City%20News%20Day%20Zero%20Newsletter.pdf [2019, June 9].

City of Cape Town. 2018b. *Collection and Use of Seawater for Household Purposes Guideline*. Available: http://resource.capetown.gov.za/documentcentre/Documents/Procedures,%20guidelines%20and%20regulations/Guidelines_collection_use%20sea%20water%20for%20household.pdf [2019, June 9].

City of Cape Town. 2018c. *IDP Annexure: CT Drought Response.* Available: http://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Critical%20Water%20Shortages%20Plan-Drought%20response.pdf [2019, June 9].

City of Cape Town. 2018d. *Water Meters and Water Management Devices A4 Pamphlet* [Pamphlet]. Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2018e. *Water Outlook 2018 Presentation.* Available: http://www.capetown.gov.za/Family%20and%20home/Education-and-research-materials/Graphics-and-educational-material/water-saving-resources [2019, June 9].

City of Cape Town. 2018f. *9 January 2018: Executive Mayor's Statement - City secures Bigger Yield From Aquifers- Water Usage Still Too High* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/9%20January%2018-%20City%20secures%20bigger%20yield%20from%20aquifers.pdf [2019, June 9].

City of Cape Town. 2018g. *11 January 2018: Executive Mayor's Statement- City Starts Drilling for Groundwater From Cape Flats Aquifer* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/11%20January%2018-%20City%20starts%20drilling%20for%20groundwater.pdf [2019, June 9].

City of Cape Town. 2018h. *11 January 2018: Executive Mayor's Statement- Proposed Drought Charge* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/11%20Jan%2018-%20Proposed%20drought%20charge%20.pdf [2019, June 9].

City of Cape Town. 2018i. *16 January 2018: Executive Mayor's Statement- Cape Town Residents Must Reduce Consumption To Avoid Day Zero* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/16%20January%2018-%20Cape%20Town%20residents%20must%20reduce%20consumption%20to%20avoid%20Day%20Zero.pdf [2019, June 9].

City of Cape Town. 2018j. *18 January 2018: Executive Mayor's Statement -Day Zero Now Likely To Happen* [Statement]. Available: http://resource.capetown.gov.za/documentcentre/Documents/Speeches%20and%20statements/18%20January%2018-%20Day%20Zero%20new%20emergency%20measures.pdf [2019, June 9].

City of Cape Town. 2019a. *Cape Town Water Strategy (draft for comment)*. Available: https://cdn.24.co.za/files/Cms/General/d/2641/4211652e52d649d8a69638dfbc398814.pdf [2019, November 22].

City of Cape Town. 2019b. *Water and Sanitation Department*. Available: http://www.capetown.gov.za/Departments/Water%20and%20Sanitation%20Department [2019, May 27].

Crow, D. A. & Lawlor, A. 2016. Media in the policy process: Using framing and narratives to understand policy influences. *Review of Policy Research.* 33(5):472-491.

CSAG. 2019. *Big Six WCWSS Dams.* Available: http://cip.csag.uct.ac.za/monitoring/bigsix.html [2019, May 27].

De Lille, P. & Kesson, C. 2017. *View from City Hall.* Jonathan Ball Publishers: Johannesburg.

Dolnicar, S., Hurlimann, A. & Grün, B. 2012. Water conservation behaviour in Australia. *Journal for Environmental Management.* 105(14):44-52.

DWS. 2019. *Reconciliation Strategy for the Western Cape Water Supply System.* Available: http://www.dwa.gov.za/Projects/RS_WC_WSS/sa.aspx [2019, May 27].

Dubois, A. & Gadde, L. E. 2002. Systematic combining: an abductive approach to case research. *Journal of Business Research.* 55:553-560.

Dziegielewski, B. 1991. The drought is real - designing a successful water conservation campaign. *International Conference and Exhibition on Efficient Water Use.* 21-25 October 1991. Mexico City: IWRA.

Entman, R. M. 2007. Framing bias: media in the distribution of power. *Journal of Communication.* 57:163-173.

Eriksson, M. 2012. On-line strategic crisis communication: in search of a descriptive model approach. *International Journal of Strategic Communication.* 6(4):309-327.

Goffman, E. 1974. *Frame Analysis: An Essay on the Organisation of Experience.* Northeastern University Press: Boston.

Google Trends. 2019. Available: https://trends.google.com/trends/explore?date=today%205-y&q=cape%20town%20drought. Accessed: 2019, April 25.

Head, B. W. 2014. Managing urban water crises: adaptive policy responses to drought and flood in Southeast Queensland, Australia. *Ecology and Society.* 19(2).

Hurlbert, M. & Gupta, J. 2016. Adaptive governance, uncertainty, and risk: policy framing and responses to climate change, drought, and flood. *Risk Analysis.* 36(2):339-56.

IAEA. 2011. *All about water.* Available: https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull53-1/53105911720.pdf [2018, October 28].

Kohl, E. & Knox, J. A. 2016. My drought is different from your drought: a case study of the policy implications of multiple ways of knowing drought. *Weather, Climate, and Society.* 8(4):373-388.

Laws, D. & Rein, M. 2003. Reframing practice. *Deliberative Policy Analysis: Understanding Governance in the Network Society.* M. Hajer & H. Wagenaar, Eds. Cambridge: Cambridge University Press. 172-206.

Liang, Y. J., Henderson, L. K. & Kee, K. F. 2018. Towards an integrated model of strategic environmental communication: advancing theories of reactance and planned behaviour in a water conservation context. *Journal of Applied Communication Research.* 46(2):135-154.

Municipalities of South Africa. 2019. *City of Cape Town Metropolitan Municipality.* Available: https://municipalities.co.za/overview/6/city-of-cape-town-metropolitan-municipality [2019, May 27].

Naik, P. K. 2017. Water crisis in Africa: myth or reality? *International Journal of Water Resources Development.* 33(2):326-339.

Neto, S. 2016. Water governance in an urban age. *Utilities Policy.* 43:32-41.

Otto, F. E. L., Wolski, P., Lehner, F., Tebaldi, C., Jan van Oldenborgh, G., Hogesteeger, S., Singh, R., Holden, P., Fučkarl, N. S., Odoulami, R. C. & New, M. 2018. Anthropogenic influence on the drivers of the Western Cape drought 2015-2017. *Environmental Research Letters.* 13.

Palazo, J., Lui, O., Stillinger, T., Song., R., & Wang, Y. 2017. Urban responses to restrictive conservation policy during drought. *Water Resources Research.* 53(5):4459-4475.

Robins, S. 2019. ‘Day Zero’, hydraulic citizenship and the defence of the commons in Cape Town: a case study of the politics of water and its infrastructures (2017–2018). *Journal of Southern African Studies*. 45(1):5-29.

Soiferman, L. K. 2010. Compare and contrast inductive and deductive research approaches. Available: https://files.eric.ed.gov/fulltext/ED542066.pdf [2019, May 25].

South African Government. 2017. *The Constitution of the Republic of South Africa.* Available: https://www.gov.za/documents/constitution-republic-south-africa-1996 [2018, October 27].

Turner, A., White, S., Chong, J., Dickinson, M. A., Cooley, H. & Donnelly, K. 2016. *Managing drought: learning from Australia*. Available: https://www.researchgate.net/publication/297723736_Managing_Drought_Learning_from_Australia [2019, June 6].

UNESCO. 2018. *The United Nations World Water Development Report*. Available: http://unesdoc.unesco.org/images/0026/002614/261424e.pdf. [2018, October 28].

United Nations Development Programme. 2018. *Goal 6: Clean Water and Sanitation.* Available: http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation.html. [2018, October 27].

Vogel, C. & Olivier, D. 2018. Re-imagining the potential of effective drought responses in South Africa. *Regional Environmental Change*. 19(6):1561-1570.

Wazimap. 2019. *City of Cape Town*. Available: https://wazimap.co.za/profiles/municipality-CPT-city-of-cape-town/ [2019, May 27].

Western Cape Government. 2019. *Latest Western Cape dam levels*. Available: https://www.westerncape.gov.za/general-publication/latest-western-cape-dam-levels [2019, May 28].

Wilhite, D. A., Sivakumar, M. V. K. & Pulwarty, R. 2014. Managing drought risk in a changing climate: the role of national drought policy. *Weather and Climate Extremes.* 2:4-13.

Wolski, P. 2018. *What Cape Town learned from its drought.* Available: https://thebulletin.org/2018/04/what-cape-town-learned-from-its-drought/ [2019, May 27].

Ziervogel. G. 2018. Climate adaptation and water scarcity in Southern Africa. *Current history*. 181-186.

Ziervogel, G. 2019. *Unpacking the Cape Town Drought: Lessons Learned*. Available: https://www.africancentreforcities.net/wp-content/uploads/2019/02/Ziervogel-2019-Lessons-from-Cape-Town-Drought_A.pdf [2019, April 15].

Appendix I

Initial scoping analysis of data

Stream A

Date of release	Title	Medium/Format	Issued by	Target audience	"Hero" positioning [names mentioned]	"Blame" placement [names mentioned]	Other notes	Relevant quotes and excerpts
29-03-2017	*29 March 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017y)*	Speech (council meeting)	Executive Mayor	CCT Council	residents and businesses	high consumption users		"I have given an instruction that we simply must do everything we can to start implementing these new schemes in the current financial year already and find the budget to do so in order to augment our water supplies as soon as possible"
26-04-2017	*26 April 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017z)*	Speech (council meeting)	Executive Mayor	CCT Council	residents and businesses	residents using potable water in gardens	Speaks of national soccer and collaboration for water-wise management of sport fields	
30-05-2017	*30 May 2017: Executive Mayor's Budget Speech (City of Cape Town, 2017aa)*	Speech (council meeting)	Executive Mayor	CCT Council	residents and businesses	Capetonians	New normal' begins to be used	"This is going become the new normal for Cape Town."
27-07-2017	*27 July 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ab)*	Speech (council meeting)	Executive Mayor	CCT Council	residents and businesses	high consumption users and businesses that use large amounts of water		
16-08-2017	*16 August 2017: Executive Mayor's Statement- High Consumption Households (City of Cape Town, 2017ac)*	Statement	Executive Mayor	CT residents	CT residents/Captonians	high consumption users	Tone - slightly desperate. Majority reference to the installation of water management devices at high consumption households	"The directive stated that in the event of non-compliance with Level 4b water restrictions and the 87 litres per person per day target, the City will, in terms of Section 36(4) of the By-law, at its discretion, install water management devices at premises where non-compliance is occurring." "We have issued more than enough warnings and pleaded with residents to reduce consumption, but there are still too many people who continue to flout water restrictions." "But the time for asking people to reduce excessive consumption is over and we will now forcibly restrict those households who continue to contravene water restrictions."
17-08-2017	*17 August 2017: Executive Mayor's Statement- Advancing Water Resilience (City of Cape Town, 2017ad)*	Statement	Executive Mayor	CT residents	most residents		Mostly talks about the augmentation schemes and procurement - technologies involved (desalination, water reuse, groundwater extraction). Multiple references to resilience. 'Day Zero' is used by the Mayor	"The procurement and commissioning of multiple new augmentation schemes in rapid time is going to be one the largest and most **complex** expenditure programmes in the history of the City of Cape Town." "As we prepare for the hot summer months ahead, it is imperative that the consumption does not spike, especially considering the arrival of tourists during the holiday period. It must be noted that the increased population of the city during this period is commonly offset by a reduction in business and industrial consumption of water so the increased risk is not high. Nevertheless, a campaign targeting visitors will be instituted." "At this time it must be stressed that the City has no plans to perform localised water-shedding. However, due to advanced pressure management, there may be occasions where properties in high-lying areas in various supply zones are will be without water for short periods of time."
23-08-2017	*23 August 2017: Executive Mayor's Statement- Grant Towards Drought Relief (City of Cape Town, 2017ae)*	Statement	Executive Mayor	CT residents	National Disaster Management Centre in the Department of Cooperative Governance		Acknowledging the R20,8 Million aid from the Department and how it will be used.	"The City has been informed by the National Disaster Management Centre in the Department of Cooperative Governance that an amount of R20, 8 million will be transferred to the City of Cape Town for emergency disaster relief. "
03-09-2017	*3 September 2017: Executive Mayor's Statement (City of Cape Town, 2017af)*	Statement	Executive Mayor	CT residents	CT residents/Captonians		Level 5 restrictions. Calls to commercial sector to reduce water. Includes links to Think Water website and water calculator, as well as an email address for queries.	
19-10-2017	*19 October 2017: Executive Mayor's Statement- City Hosts 600 Business Sector Representatives (City of Cape Town, 2017ag)*	Statement	Executive Mayor	Business sector representatives	creative and resilient business leaders; CCT		Aim to appeal to and engage business sector in the drought efforts	" the City scrapped its old 30-year water plan and adopted a new scenario called the New Normal where we are no longer relying on only rainwater to fill our dams, but understand that we require a fundamental change in our behaviour with water – an increasingly scarce resource." "As a City, we never pretended to have all the answers..." "The City has always been a very responsible player in the Western Cape Water Supply System – the dam system that serves our city, some surrounding municipalities and agricultural users. Our draw down of water from the dams has been lower than our allocation as per the rules of the system."
26-10-2017	*26 October 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ah)*	Speech (council meeting)	Executive Mayor	CCT Council	CT residents/Captonians		Summary on augmentation plans; challenges posed by national level approval process	"I want to assure residents again that we will not allow a well-run city to run out of water and this will be achieved through progressive savings and our multi-layered augmentation plan to build water resilience." "I am making a commitment today that we will be improving our efforts to communicate directly with all Capetonians on our augmentation plans." "What we are currently facing is not unique. Many cities around the world have to deal with the impacts of climate change." "the City is exploring a range of further options to extend the new water resources on a more permanent basis as part of our resilience efforts."
30-10-2017	*30 October 2017: Executive Mayor's Statement (City of Cape Town, 2017ai)*	Statement	Executive Mayor	CT residents	CT residents/Captonians			"In line with my commitment last week to communicate directly with all Capetonians, the City will make the dam level and consumption data available on a daily basis."

10-2017	*Critical Water Shortages Disaster Plan Summary (City of Cape Town, 2017c)*	Public Summary	CCT	CT residents			Explains the CCT's Critical Water Shortages Disaster Plan (Phases1, 2 and 3) - devised to prepare and guide CCT action if/when water supply further declined	"We are now in Phase 1 of the disaster plan which entails water rationing. The other two phases comprises disaster phases and more extreme disaster interventions." "v. the establishment of strategic communication links; and vi. the dissemination of information [part of the plan]" "Constant monitoring, updating and revision are key to this dynamic situation. The City will continue to use absolutely all drought interventions at its disposal."
02-11-2017	*2 November 2017: Refurbished Atlantis Aquifer Executive Mayor's Speech (City of Cape Town, 2017aj)*	Speech	Executive Mayor	CT residents	CT residents/Captonians		Talks about the refurbishment of state boreholes to offer additional water supply from the aquifer	
08-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017ak)*	Statement	Executive Mayor	CT residents			Talks about the refurbishment of state springs to offer additional water supply	"We will continue working on a range of augmentation plans, fast-tracking processes as much as possible to bring alternative sources of drinking water online, including desalination, ground water extraction, and water reuse as we build a water-resilient Cape Town. Together with the great water-saving efforts of residents, we will make it through this unprecedented drought. "
09-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017al)*	Statement	Executive Mayor	CT residents	CT residents/Captonians		Talks about assessments on unused pipelines for use with desalination. No specific mention of 'crisis' or 'day zero'	
13-11-2017	*13 November 2017: Executive Mayor's Statement- Bad Weather Leads To Decline in Dam Levels (City of Cape Town, 2017am)*	Statement	Executive Mayor	CT residents	water saving residents	non-saving residents	Talks about evaporation, its effect on water supply and going into summer period	
15-11-2017	*15 November 2017: Executive Mayor's Statement- Removal Of Alien Vegetation at Wemmershoek Dam (City of Cape Town, 2017an)*	Statement	Executive Mayor	CT residents	CT residents/Captonians		Talks about the removal of alien vegetation in catchment areas to extend supply	"Over the last year, a City of Cape Town-appointed contractor has cut down over 50 hectares of pine trees from a city plantation used for commercial and industrial purposes. The remaining 110 hectares will be cleared over the next year. Removing these remaining plantations will improve stream flow into the dam and could secure an extra week or month worth of water supply for the city."
16-11-2017	*16 November 2017: Executive Mayor's Statement- Day Zero (City of Cape Town, 2017ao)*	Statement	Executive Mayor	CT residents			Talks about the meaning of Day Zero, when and how it would play out by the CCT	"Day Zero can be avoided. Capetonians have done amazing work to save water. Most residents are saving water but we need every single person to use the prescribed 87 litres per person per day. If we don't have everyone restricting their water consumption, we will reach Day Zero in May."
19-11-2017	*19 November 2017: Executive Mayor's Statement- Exploratory Work At Steenbras (City of Cape Town, 2017ap)*	Statement	Executive Mayor	CT residents	CT residents/Captonians		Talks about potential additional sites for aquifer water abstraction	"The TMG aquifers have the potential to develop a large scale scheme to augment the City's water supply on a more permanent basis."
23-11-2017	*23 November 2017: Executive Mayor's Statement- City Launches Weekly Water Dashboard (City of Cape Town, 2017aq)*	Statement	Executive Mayor	CT residents	CT residents/Captonians	non-saving residents	Talks about the launch of the water dashboard for weekly updates regarding the drought situation	"The weekly Water Dashboard will work as follows: 1. First, it will show the City's augmentation plan progress. 2. Secondly, it will track the dam behaviour 3. Thirdly, it will track our collective consumption Together, these factors ultimately influence Day Zero and whatever we do affects this date. This will be a live management tool to hold us all accountable." "It must be noted that when looking at the dams versus our consumption, the City of Cape Town is not the only user of the Western Cape Water Supply System and therefore we are not the only influencer of the weekly draw-down rate of the dams...The City of Cape Town is responsible for approximately 64% of the dam draw-down on an annual basis. The City has no control over the other 46% of dam usage."
26-11-2017	*26 November 2017: Executive Mayor's Statement- Aerial Mapping Of The Cape Flats Aquifer [sic] (City of Cape Town, 2017ar)*	Statement	Executive Mayor	CT residents	CT residents/Captonians		Talks about aerial surveys of Cape flats for additional abstraction	"The Cape Flats Aquifer will bring an additional 25 million litres of water per day from June 2018."
28-11-2017	*28 November 2017: Executive Mayor's Statement- Weekly Dashboard (City of Cape Town, 2017as)*	Statement	Executive Mayor	CT residents	CT residents/Captonians	non-saving residents	Talks about an alarming spike in consumption, which is partially offset by unusual summer rainfall for that week	
03-12-2017	*3 December 2017, Executive Mayor's Statement: Day Zero (City of Cape Town, 2017at)*	Statement	Executive Mayor	CT residents	CT residents/Captonians	non-saving residents	Continued installation of water management devices at excessive water households. Disapproving tone	"The City has taken actions to install water management devices at 18 597 high consumption households across the city so far where contraventions have occurred." "The Water and Sanitation Department staff are working extremely long days to help the City conserve water by restricting delinquent users. We have begged people to save water, but we cannot allow the flagrant abuse of water to continue unabated."
12-12-2017	*12 December 2017: Executive Mayor's Statement- Water Dashboard Reveals Alarming High Consumption Trend (City of Cape Town, 2017au)*	Statement	Executive Mayor	CT residents				"At this time of year, the heat increases the evaporation rate so intensified water savings are a must. We appeal to residents to please step up their water-saving efforts as we can only get through this together. The City will also continue its roll-out of water management devices to restrict households who are still using excessive amounts of water."

12-2017	*Pressure Reduction Guideline Summary (City of Cape Town, 2017j)*	Public Summary	CCT	CT residents			Brief explanation of pressure reduction. Very brief - just info no blame/hero stuff.	"The City's reticulation system is divided into pressure zones. Water pressure, which controls the flow of water, is managed by adjusting valves in the reticulation network. We use pressure reduction to forcefully lower water usage."
12-2017	*Water Rationing Dos and Don'ts Guideline (City of Cape Town, 2017s)*	Information statement (doc. sheet)	CCT	CT residents			States actions to be taken and avoided with rationing water. Very brief - just info no blame/hero stuff.	
09-01-2018	*9 January 2018: Executive Mayor's Statement- City secures Bigger Yield From Aquifers- Water Usage Still Too High (City of Cape Town, 2018f)*	Statement	Executive Mayor	CT residents	water saving visitors and locals		Talks about groundwater abstraction from the aquifer (around 150 million L per day). Said to be a more cost-effective compared with reuse and desalination. In order to cover costs, a drought charge is proposed and open to public comment.	"Importantly, this action to help Cape Town get through the drought is based on an environmentally sensitive approach that will ensure sustainable water abstraction, ensuring generations of Capetonians will benefit from this groundwater supply." "We need to raise money to pay for these projects and, more importantly, to maintain our water reticulation system. To do this, we have proposed the drought charge and invited public comment. We've received some 45 000 comments to date." "Holiday consumption remained the same despite increased numbers of tourists. This was due to the normal in- and outflow of residents and tourists. I thank all of our visitors and locals for their efforts to continue to save water. We cannot do it without you."
11-01-2018	*11 January 2018: Executive Mayor's Statement- City Starts Drilling for Groundwater From Cape Flats Aquifer (City of Cape Town, 2018g)*	Statement	Executive Mayor	CT residents			Continues on about groundwater abstraction and pilot testing at various drill sites.	" Abstracting groundwater in bigger volumes means that the City can deliver more water to our residents at a lower cost for the benefit of all of Cape Town."
11-01-2018	*11 January 2018: Executive Mayor's Statement- Proposed Drought Charge (City of Cape Town, 2018h)*	Statement	Executive Mayor	CT residents			Explains the proposed drought charge.	"The drought charge is needed to make up the deficit in the City's revenue which has come about due to residents' water savings and paying significantly less for water and sanitation." " temporary additional charge based on existing property valuations that will assist with the City's budget shortfall."
16-01-2018	*16 January 2018: Executive Mayor's Statement- Cape Town Residents Must Reduce Consumption To Avoid Day Zero (City of Cape Town, 2018i)*	Statement	Executive Mayor	CT residents	water saving residents		Emphasises the need for all residents to minimise their consumption. Mention that level 6 restrictions have been in place since Jan 1st.	"These projects, however, will only ensure water security in the long run and we cannot relax our water saving efforts for one day. We must stay committed to saving water. It is the only way Cape Town can avoid Day Zero."
18-01-2018	*18 January 2018: Executive Mayor's Statement -Day Zero Now Likely To Happen (City of Cape Town, 2018j)*	Statement	Executive Mayor	CT residents			drought charge is dropped. tone - irritation/frustration about non-saving residents (60%). 6B level restrictions are to come into effect Feb 1st (50L/day). The looming threat of Day Zero gets real with site allocations.	"Day Zero is now likely 60% of Capetonians won't save water and we must now force them Punitive tariff to force high users to reduce demand 50 litres per person per day for the next 150 days Drought Charge likely to be scrapped by Council" "The people who are still wasting water seem to believe that Day Zero just can't happen or that the City's seven augmentation projects - set to produce around 200 million litres per day - will be enough to save us. This is not the case and, while our water augmentation programme will make Cape Town more water resilient in the future, it was never going to be enough to stop Day Zero." "The new daily collective consumption target is now 450 million litres per day. This will be in place for 150 days after which the City will reassess the situation. Level 6B restrictions will also limit irrigation using boreholes and wellpoints." " City will be announcing everyone's local collection points from next week so that communities can begin preparing for that eventuality." "Cape Town, this is the moment where we can bring about the fundamental behaviour change that is needed to save us all from running out of water. The time to act for everyone's sake is now. So if we reduce the demand enough now, we can still get our water delivered to our houses and not have to queue daily for our allocation."
05-02-2018	*IDP Annexure: CT Drought Response (City of Cape Town, 2018c)*	Annexure to public summary [see item 1710.04]	CCT	CT residents			Information about CCT's Critical Water Shortage Plan	"The disaster plan adopts a cautious approach and assumes very little additional supply measures until the next rainy season, thereby preparing for a worst case scenario. This planning approach is not a reflection on the City's confidence in the water supply demand management and augmentation programme, but a strategy to ensure that the City is adequately prepared to manage increasingly severe drought conditions as they intensify over time." "Primarily, the disaster plan outlines scenarios which are intended to focus attention on the actions that are required to ensure good governance, the protection of human life in the face" "A water augmentation plan is designed to protect existing water rights by diversifying supply from reliance on groundwater to other sources. Augmentation plans for the City due to the severe drought and subsequent shortage of water is programmed till June 2022 to reach a resilient water supply position."
03-2018	*Collection and Use of Seawater for Household Purposes Guideline (City of Cape Town, 2018b)*	Information statement (doc. sheet)	CCT	CT residents			Information about using seawater for flushing and filling pools.	"The City's wastewater treatment works are designed to treat wastewater originating from drinking water, but not from sewage combined with seawater. The chemical compounds found in seawater are known to interfere with the biological treatment processes that occur at the treatment plants. For the reasons above, the use of seawater for flushing toilets and for topping up conventional swimming pools is not envisaged in the long term."

Stream B								
Date of release	**Title**	**Medium/Format**	**Issued by**	**Target audience**	**"Hero" positioning**	**"Blame" placement**	**Other notes**	**Relevant quotes and excerpts**
11-04-2017	*Wemmershoek-1-2017 (City of Cape Town, 2017v)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken at eye-level. Emphasis on low water supply - beach, rocks and measuring markers on tower. No text. No notes or contextual information.	
11-04-2017	*Wemmershoek-2-2017 (City of Cape Town, 2017w)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken at eye-level. Emphasis on low water supply - beach and rocks. Dry and arid surrounds - dried up vegetation. No text. No notes or contextual information.	
11-04-2017	*Wemmershoek-3-2017 (City of Cape Town, 2017x)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken at eye-level. Emphasis on low water supply - exposed rocks that are usually submerged in water. Dry and arid. No text. No notes or contextual information.	
19-04-2017	*Steenbras-May2017 (City of Cape Town, 2017o)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken from above (helicopter). Emphasis on low water supply - pronounced sand beds along edge. Dry mountain tops in background. No text. No notes or contextual information.	
13-07-2017	*Theewaterskloof-2-Jul2017 (City of Cape Town, 2017q)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken from above. Emphasis on low water supply - pronounced arid sand beds along edges. Ominous dark clouds above. No text. No notes or contextual information.	
13-07-2017	*Theewaterskloof-Jul2017 (City of Cape Town, 2017p)*	Photograph	CCT (graphics and educational material)				Photo of dam. Taken at eye-level. Emphasis on low water supply - pronounced sand banks and dried up vegetation in foreground. Sandcloud sweeping over in middleground. No text. No notes or contextual information.	
02-10-2017	*Find and Fix Leaks (City of Cape Town, 2017f)*	Poster	Thinkwater	CT property owners		people who have leaks and do not mend them	Poster showing steps to check for leaks.	"Leaks can waste a lot of water, especially if they are undetected or underground and left for a long time. Leaks on your property are your responsibility" " you need to take action as per the City's By-law."
04-10-2017	*Critical Water Shortages Disaster Plan presentation (City of Cape Town, 2017b)*	Powerpoint Presentation	CCT (graphics and educational material)				Powerpoint presentation explaining the three phase plan the CCT devised to respond to critical water shortage disasters. Phase one was implemented during the CT water crisis.	"City will do everything in its power to prevent the need for Phase 2: Disaster Restrictions to be implemented" "the City is prepared to implement Phase 2: Disaster Restrictions if it is necessary to reduce the daily consumption in order to ensure that Phase 3: Day Zero (full-scale disaster implementation) never occurs"
11-10-2017	*Level 5 Water Restrictions Infographic (City of Cape Town, 2017h)*	Infographic	Thinkwater	CT residents			Smiling cartoon proudly holding water bottle. Info about level 5 restrictions of 70L per person daily. States some actions that are and are not allowed regarding water use.	
17-10-2017	*Water Saving Checklist (City of Cape Town, 2017t)*	Information Guide	CCT (graphics and educational material)	CT residents			Speaks about water-saving tips to adopt (toilet flushing, short showers, flow restrictors, grey water use etc.). Offers actionable recommendations.	"The more you save, the less you pay – and more water remains in our dams."
19-10-2017	*DIY Find and Fix Water Leaks Guide (City of Cape Town, 2017e)*	Information Guide	Thinkwater	CT property owners			A comprehensive overview on how leaks should be detected and handled.	
26-10-2017	*Banner (City of Cape Town, 2017a)*	Photograph/banner	CCT (graphics and educational material)	CT residents	people engaging in water-saving activities	people who are not contributing to the water-saving effort	Image of dried-up dam with text overlay.	"Lets save, Cape Town! Together."
03-11-2017	*Permission cubicle A4 Poster English (City of Cape Town, 2017i)*	Poster	Thinkwater	CT residents	minimum-flushing residents			"They pledge to: • let it mellow if it's yellow • only flush when necessary • not use the toilet as a dustbin. Every time we don't flush, we're saving about 9 litres of drinking water."
21-11-2017	*Water Rationing A4 poster (City of Cape Town, 2017r)*	Poster (announcement poster)	CCT (graphics and educational material)	CT residents			Poster-style announcement of rationing through pressure management to extend supply.	
28-11-2017	*Water saving plumbing checklist (City of Cape Town, 2017u)*	Information Guide	Thinkwater	CT property owners			Overview of water-saving actions regarding plumbing.	
05-12-2017	*Save Like a Local Tourist Campaign- Pamphlet (City of Cape Town, 2017l)*	Pamphlet	Thinkwater	visitors	locals	non-abiding persons (implied)	Save like a local campaign - aimed at tourists and visitors, to be more mindful in relatively small ways to save water.	"Cape Town is experiencing its worst drought ever" "Wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth"

21-11-2017	*Water Rationing A4 poster (City of Cape Town, 2017r)*	Poster (announcement poster)	CCT (graphics and educational material)	CT residents			Poster-style announcement of rationing through pressure management to extend supply.	
28-11-2017	*Water saving plumbing checklist (City of Cape Town, 2017u)*	Information Guide	Thinkwater	CT property owners			Overview of water-saving actions regarding plumbing.	
05-12-2017	*Save Like a Local Tourist Campaign- Pamphlet (City of Cape Town, 2017l)*	Pamphlet	Thinkwater	visitors	locals	non-abiding persons (implied)	Save like a local campaign - aimed at tourists and visitors, to be more mindful in relatively small ways to save water.	"Cape Town is experiencing its worst drought ever" "Wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth"
05-12-2017	*Save Like a Local Tourist Campaign- Door Hanger- Poster (City of Cape Town, 2017k)*	Poster (door hanger)	Thinkwater	visitors	locals	non-abiding persons (implied)	Save like a local campaign - aimed at tourists and visitors, to be more mindful in relatively small ways to save water.	"Cape Town is experiencing its worst drought ever" "Wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth"
05-12-2017	*Save Like a Local Tourist Campaign-Tent Card- Poster (City of Cape Town, 2017n)*	Poster (tent card)	Thinkwater	visitors	locals	non-abiding persons (implied)	Save like a local campaign - aimed at tourists and visitors, to be more mindful in relatively small ways to save water.	"Wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth"
05-12-2017	*Save Like a Local Tourist Campaign- Poster (City of Cape Town, 2017m)*	Poster (A2)	Thinkwater	visitors	locals	non-abiding persons (implied)	Save like a local campaign - aimed at tourists and visitors, to be more mindful in relatively small ways to save water.	"Cape Town is experiencing its worst drought ever" "Wash hands less frequently and use sanitiser instead. Only flush when you need to. Take short, stop-start showers. Don't leave the tap running while brushing teeth"
06-12-2017	*Guide on Water Rationing A4 Poster (City of Cape Town, 2017g)*	Information Guide	Thinkwater	CT residents			Information on pressure management and guide for water rationing.	"This is like continuously filling a bucket full of holes. The bottom holes will have the highest pressure and will drain more water than the holes higher up. Water will at first drain from all the holes but as the water level drops, the holes higher up in the bucket will start trickling until the level water level drops past the hole and no more water will flow. If the holes at the bottom are plugged, the water will slowly rise to the top again."
19-12-2017	*CoCT Save like a local Residents Flags (City of Cape Town, 20*	Posters	CCT (graphics and educational material)	CT residents	people engaging in water-saving activities	non-abiding persons (implied)	PDF doc containing multiple posters of residents faces and quotes about how and why they are saving water.	"Together we can avoid Day Zero" "I'm saving water because our lives depend on it." "I'm saving water while we still have water to save." "I'm saving water, so we don't have to queue for it."
01-02-2018	*Water Meters and Water Management Devices A4 Pamphlet (City of Cape Town, 2018d)*	Information Guide	Thinkwater	CT residents	water saving residents	non-abiding persons (implied)	Guide for reading water meters and WMDs. An effort to engage residents to be conservative and aware of their own usage, and to be vigilant of leaks.	"The City is doing absolutely everything in its power to get Cape Town through this drought but we need the support of our residents. Water is life. We urge you to join the efforts of the City and so many Capetonians to beat this drought together and to avoid Day Zero, the day when our taps run dry. Please note that water restrictions and water usage targets may be changed at short notice in an effort to respond to the crisis."
19-02-2018	*Water Outlook 2018 Presentation (City of Cape Town, 2018e)*	Powerpoint Presentation	CCT (graphics and educational material)				PPT of water outlook at feb 2018. Overview of dams, consumption, augmentation and other measures implemented for water reduction and cost recovery.	
02-2018	*City News, Issue 44: Day Zero Residents Newsletter (City of Cape Town, 2018a)*	Newsletter	CCT	CT residents	water saving residents	non-saving residents	News-feature style with colourful infographics, pictures and catchy phrases. Includes info covered in many of the previous releases but in a way that in very much geared for public conscious and behaviour. Summaries the drought situation, dam levels, pressure reduction and tariff increases. Emphasises the threat of reaching Day Zero, and how to effectively utilise 50 L of water per person daily. Also talks about health threats, plastic bottle recycling and augmentation plans.	"If everyone is frugal, residents will be able to get water from their taps throughout this year." "We will be ready, if we have to. But, Team Cape Town, if we all stick to 50 l a day, we won't have to." "additional sources will not stop the crisis, but help ease usage and allow the dams to refill over the next two years"

Appendix II

Framing aspects identified in the data and key for codes

Stream A

Date	Title	*frame types by codes*	CRI-NON	CRI-CRI	PUR-PRO	PUR-MOT	PUR-REC	PUR-INF	PRI-ENV	PRI-SOC	PRI-POL	PRI-ECO	CAU-HUM	CAU-NAT	PRO-TEC	PRO-CON	PRO-HYD	TEM-LNG	TEM-SHR	REA-PER	REA-ISO	MAN-UND	MAN-UNC	MAN-CON	MAN-CAN	RES-GOV	RES-PUB	UND-EFF	UND-UNC	AFF-WEA	AFF-POR	AFF-ALL	OTH-COL	OTH-HEA	OTH-RES	OTH-THR	OTH-CON
29-03-2017	*29 March 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017y)*			x	x					x		x		x	x	x		x		x				x		x	x						x				
26-04-2017	*26 April 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017z)*			x	x		x	x		x		x		x	x	x	x							x		x	x						x				
30-05-2017	*30 May 2017: Executive Mayor's Budget Speech (City of Cape Town, 2017aa)*			x	x			x		x			x	x	x	x	x	x						x		x	x						x				x
27-07-2017	*27 July 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ab)*			x	x			x		x			x	x	x	x	x	x		x				x		x	x					x	x			x	
16-08-2017	*16 August 2017: Executive Mayor's Statement- High Consumption Households (City of Cape Town, 2017ac)*			x	x			x		x			x	x		x	x	x						x		x	x					x	x			x	
17-08-2017	*17 August 2017: Executive Mayor's Statement- Advancing Water Resilience (City of Cape Town, 2017ad)*			x	x		x	x		x		x	x	x	x			x			x			x		x	x						x		x	x	
23-08-2017	*23 August 2017: Executive Mayor's Statement- Grant Towards Drought Relief (City of Cape Town, 2017ae)*			x	x									x	x			x						x		x											
03-09-2017	*3 September 2017: Executive Mayor's Statement (City of Cape Town, 2017af)*			x	x		x	x		x		x		x	x	x	x	x			x			x		x	x						x				x
19-10-2017	*19 October 2017: Executive Mayor's Statement- City Hosts 600 Business Sector Representatives (City of Cape Town, 2017ag)*			x	x	x	x			x		x	x	x	x	x	x	x	x	x	x			x		x	x		x				x		x		
26-10-2017	*26 October 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ah)*			x	x				x	x		x	x	x	x	x	x				x			x		x	x						x		x		
30-10-2017	*30 October 2017: Executive Mayor's Statement (City of Cape Town, 2017ai)*			x	x							x	x	x	x		x	x			x			x		x	x						x		x		
10-2017	*Critical Water Shortages Disaster Plan Summary (City of Cape Town, 2017c)*			x	x					x			x	x	x	x	x	x	x	x	x			x		x	x				x			x		x	
02-11-2017	*2 November 2017: Refurbished Atlantis Aquifer Executive Mayor's Speech (City of Cape Town, 2017aj)*			x	x					x				x	x	x			x			x		x		x	x						x				
08-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017ak)*			x	x					x				x	x	x			x			x		x		x	x								x		
09-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017al)*				x					x				x	x	x			x		x	x		x		x	x						x				x
13-11-2017	*13 November 2017: Executive Mayor's Statement- Bad Weather Leads To Decline in Dam Levels (City of Cape Town, 2017am)*			x	x					x		x	x	x	x	x	x		x			x		x		x	x						x				
15-11-2017	*15 November 2017: Executive Mayor's Statement- Removal Of Alien Vegetation at Wemmershoek Dam (City of Cape Town, 2017an)*			x	x				x	x			x	x	x	x	x	x	x			x		x		x	x						x				x
16-11-2017	*16 November 2017: Executive Mayor's Statement- Day Zero (City of Cape Town, 2017ao)*			x	x					x				x	x	x			x			x		x		x	x						x				x
19-11-2017	*19 November 2017: Executive Mayor's Statement- Exploratory Work At Steenbras (City of Cape Town, 2017ap)*			x	x				x				x	x	x	x	x	x	x					x		x	x						x				x
23-11-2017	*23 November 2017: Executive Mayor's Statement- City Launches Weekly Water Dashboard (City of Cape Town, 2017aq)*			x	x					x			x	x	x	x	x		x					x		x	x						x			x	x
26-11-2017	*26 November 2017: Executive Mayor's Statement- Aerial Mapping Of The Cape Flats Aquifer [sic] (City of Cape Town, 2017ar)*				x					x					x				x				x		x		x						x				x
28-11-2017	*28 November 2017: Executive Mayor's Statement- Weekly Dashboard (City of Cape Town, 2017as)*			x	x					x			x	x		x	x		x					x			x						x			x	x
03-12-2017	*3 December 2017, Executive Mayor's Statement: Day Zero (City of Cape Town, 2017at)*			x	x			x		x			x			x			x					x			x						x			x	x
12-12-2017	*12 December 2017: Executive Mayor's Statement- Water Dashboard Reveals Alarming High Consumption Trend (City of Cape Town, 2017au)*			x	x		x			x			x	x		x	x	x	x					x			x						x				x
12-2017	*Pressure Reduction Guideline Summary (City of Cape Town, 2017j)*				x			x					x		x	x					x			x		x	x								x		
12-2017	*Water Rationing Dos and Don'ts Guideline (City of Cape Town, 2017s)*				x		x	x		x			x			x					x			x			x										
09-01-2018	*9 January 2018: Executive Mayor's Statement- City secures Bigger Yield From Aquifers- Water Usage Still Too High (City of Cape Town, 2018f)*			x	x				x	x			x			x								x						x		x				
11-01-2018	*11 January 2018: Executive Mayor's Statement- City Starts Drilling for Groundwater From Cape Flats Aquifer (City of Cape Town, 2018g)*			x	x				x	x			x		x	x								x		x	x						x				x
11-01-2018	*11 January 2018: Executive Mayor's Statement- Proposed Drought Charge (City of Cape Town, 2018h)*				x		x			x		x	x		x	x			x					x		x	x			x							
16-01-2018	*16 January 2018: Executive Mayor's Statement- Cape Town Residents Must Reduce Consumption To Avoid Day Zero (City of Cape Town, 2018i)*			x	x	x				x			x	x	x	x		x	x		x			x								x		x	x	x
18-01-2018	*18 January 2018: Executive Mayor's Statement -Day Zero Now Likely To Happen (City of Cape Town, 2018j)*			x	x			x		x		x	x		x	x		x	x	x				x		x	x					x	x		x	x
05-02-2018	*IDP Annexure: CT Drought Response (City of Cape Town, 2018c)*			x	x					x			x	x	x	x	x	x						x		x	x								x		
03-2018	*Collection and Use of Seawater for Household Purposes Guideline (City of Cape Town, 2018b)*			x	x		x		x	x			x						x					x		x	x										
	TOTALS:		**0**	**29**	**33**	**2**	**9**	**10**	**9**	**29**	**3**	**9**	**24**	**23**	**27**	**31**	**17**	**17**	**18**	**6**	**8**	**11**	**1**	**33**	**0**	**27**	**31**	**2**	**2**	**2**	**3**	**4**	**26**	**3**	**9**	**9**	**15**

Stream B

Date	Title	frame types by codes	CRI-NON	CRI-CRI	PUR-PRO	PUR-MOT	PUR-REC	PUR-INF	PRI-ENV	PRI-SOC	PRI-POL	PRI-ECO	CAU-HUM	CAU-NAT	PRO-TEC	PRO-CON	PRO-HYD	TEM-LNG	TEM-SHR	REA-PER	REA-ISO	MAN-UND	MAN-UNC	MAN-CON	MAN-CAN	RES-GOV	RES-PUB	UND-EFF	UND-UNC	AFF-WEA	AFF-POR	AFF-ALL	OTH-COL	OTH-HEA	OTH-RES	OTH-THR	OTH-CON
11-04-2017	*Wemmershoek-1-2017 (City of Cape Town, 2017v)*				x				x					x			x																			
11-04-2017	*Wemmershoek-2-2017 (City of Cape Town, 2017w)*				x				x					x			x																			
11-04-2017	*Wemmershoek-3-2017 (City of Cape Town, 2017x)*				x				x					x			x																			
19-04-2017	*Steenbras-May2017 (City of Cape Town, 2017o)*				x				x					x			x																			
13-07-2017	*Theewaterskloof-2-Jul2017 (City of Cape Town, 2017q)*				x				x					x			x																			
13-07-2017	*Theewaterskloof-Jul2017 (City of Cape Town, 2017p)*				x				x					x			x																			
02-10-2017	*Find and Fix Leaks (City of Cape Town, 2017f)*				x		x						x		x	x								x			x					x			x	
04-10-2017	*Critical Water Shortages Disaster Plan presentation (City of Cape Town, 2017b)*			x	x					x			x			x		x	x				x		x	x						x				
11-10-2017	*Level 5 Water Restrictions Infographic (City of Cape Town, 2017h)*				x		x			x			x			x								x			x						x				
17-10-2017	*Water Saving Checklist (City of Cape Town, 2017t)*				x	x	x		x	x			x			x								x			x						x				x
19-10-2017	*DIY Find and Fix Water Leaks Guide (City of Cape Town, 2017e)*			x	x	x	x			x			x		x	x								x		x	x						x				
26-10-2017	*Banner (City of Cape Town, 2017a)*			x		x				x			x			x			x					x			x						x				
03-11-2017	*Permission cubicle A4 Poster English (City of Cape Town, 2017i)*			x			x			x			x			x								x			x						x				
21-11-2017	*Water Rationing A4 poster (City of Cape Town, 2017r)*			x	x		x	x		x			x		x	x			x		x			x		x											
28-11-2017	*Water saving plumbing checklist (City of Cape Town, 2017u)*				x		x			x			x		x	x								x		x	x										
05-12-2017	*Save Like a Local Tourist Campaign- Pamphlet (City of Cape Town, 2017l)*			x			x						x			x	x							x			x										
05-12-2017	*Save Like a Local Tourist Campaign- Door Hanger- Poster (City of Cape Town, 2017k)*			x			x						x			x	x							x			x										
05-12-2017	*Save Like a Local Tourist Campaign-Tent Card- Poster (City of Cape Town, 2017n)*						x						x			x								x			x										
05-12-2017	*Save Like a Local Tourist Campaign- Poster (City of Cape Town, 2017m)*			x			x						x			x	x							x			x										
06-12-2017	*Guide on Water Rationing A4 Poster (City of Cape Town, 2017g)*			x	x		x			x			x		x	x			x	x	x			x		x	x					x				x
19-12-2017	*CoCT Save like a local Residents Flags (City of Cape Town, 2017d)*			x		x				x			x			x								x			x					x				x
01-02-2018	*Water Meters and Water Management Devices A4 Pamphlet (City of Cape Town, 2018d)*			x	x		x						x		x	x			x					x		x	x					x			x	x
19-02-2018	*Water Outlook 2018 Presentation (City of Cape Town, 2018e)*			x	x					x		x		x	x	x	x							x		x	x					x		x	x	x
02-2018	*City News, Issue 44: Day Zero Residents Newsletter (City of Cape Town, 2018a)*			x	x	x	x			x			x	x	x	x	x	x	x					x		x	x				x	x	x	x	x	x
	TOTALS:		0	13	17	5	14	2	7	12	0	1	17	9	8	18	11	2	6	2	2	0	0	18	0	8	17	0	0	0	0	1	12	1	2	4	6

Key for framing aspects codes			
CODE	**FRAMING TYPE**	**Necessary Details:**	**Devices (associated terms, symbols or characteristics):**
crisis status framing			
CRI-			
CRI-CRI	Crisis	The water shortage is framed a crisis	"Day Zero", "crisis", "further decline", "disaster", needing saving
purpose framing			
PUR-			
PUR-PRO	Provide information	The purpose of the communication is to provide information to the public	Mention of dam supply levels, "improved public understanding", explanation of CCT/mayor's actions, educational/informational aids
PUR-MOT	Persuasive/motivational	The purpose of the communication is to persuade or motivate public participation	Encouraging/motivational phrases
PUR-REC	Recommending	The purpose of the communication is to recommend certain actions by the public	Reference to reductions in outdoor water use
PUR-INF	Inforcing	The purpose of the communication is to enforce restrictions on the public	Tariff increase, water management devices
priorities framing			
PRI-			
PRI-ENV	Environmental	The main area of concern is framed as the environmental effects of the water crisis	Reference to interventions in water catchment areas (e.g. removing alien vegetation); emphasis on low water levels in dams
PRI-SOC	Social	The main area of concern is framed as the social effects of the water crisis	"Well-being", "community", "health and hygiene"
PRI-POL	Political	The main area of concern is framed as the political effects of the water crisis	Bureaucratic challenges (e.g. approval from national level)
PRI-ECO	Economic	The main area of concern is framed as the economic effects of the water crisis	"Economy", "costs", "financial year", "commerce"
cause framing			
CAU-			
CAU-HUM	Human activity induced	The framing of the cause of the water crisis is put down to human activity	"Save water while we have it", "using too much", positive reference to water reductions. reducing demand enhances supply in dams
CAU-NAT	Natural occurrence	The framing of the cause of the water crisis is put down to natural phenomena	"Drought", "reduced annual average rainfall", lack of rain, lack of water in dams
problem rendering			
PRO-			
PRO-TEC	Technical issue	The nature of the water crisis is framed as a technical matter	"Boreholes", "desalination", "pressure management", addressing infrastructure (leaks etc.), technocratic and scientific language
PRO-CON	Consumption issue	The nature of the water crisis is framed as a matter of consumption	"Demand management"
PRO-HYD	Hydrological issue	The nature of the water crisis is framed as a hydrological matter	"Hot weather (summer)", "further decline", "drought", "climate change"
temporal framing			
TEM-			
TEM-LNG	Long-term	The temporal framing of the water crisis is long-term/permanent	"Not going away", "new normal", "water "Security"
TEM-SHR	Short-term	The temporal framing of the water crisis is short-term/temporary	A near end is implied, "navigate this period", "get through this together", "immediate future"
reach framing			
REA-			
REA-PER	Pervasive	The reach of the water crisis is framed as pervasive and city-wide or beyond	Reference to Cape Town region, "all our futures"
REA-ISO	Isolated to certain areas	The reach of the water crisis is framed as affecting isolated or certain areas	"High-lying areas"
management framing			
MAN-			
MAN-UND	Under control	The management of the water crisis is framed as under control by managing authority	"We will not let a well-run city run out of water", reference to mitigation measures coming into place
MAN-UNC	Uncontrolled	The management of the water crisis is framed as uncontrolled by managing authority	Spikes in consumption, targets not met
MAN-CON	Controllable	The management of the water crisis is framed as controllable by managing authority	"Supply schemes', 'reduction programmes", "restrictions", "targets", "save water while we have it"
responsibility framing			
RES-			
RES-GOV	Responsibility of the government	The effects of the water crisis is framed as the responsibility of government	"Emergency schemes", "augmentation", "culture of water harvesting", "proactive government"
RES-PUB	Responsibility of the public (private consumption)	The effects of the water crisis is framed as the responsibility of the public	Reference to consumption, reference to reduction measures, "save water while we have it"
understanding framing			
UND-			
UND-EFF	Effects are understood	The effects of the drought are framed as being known and understood	
UND-UNC	Uncertainty about effects	The effects of the drought are framed as being unknown or uncertain	"We never pretended to have all the answers"
affected demographics framing			
AFF-			
AFF-WEA	Wealthy will be/are affected	The water crisis is framed to affect more affluent demographics	
AFF-POR	Poor will be/are affected	The water crisis is framed to affect poorer demographics	"Most vulnerable residents of the city are least able to adapt to an escalating disaster"
AFF-ALL	All demographics will be/are affected	The water crisis is framed to affect all demographics	"All our futures"
other frames identified			
OTH-			
OTH-COL	Moral issue requiring collective effort	The water crisis is framed as a moral issue requiring collective efforts for effective solutions	Combined support in drought efforts, reference to engaging different sectors, "Team Cape Town", "the only way through this is together", "care a little, save a lot", "you should/should not…"
OTH-HEA	Health threat	The water crisis is framed as a threat to public health	
OTH-RES	Resilience framing	The water crisis is framed as a matter of resilience	"Resilience", preparing for long term change, "permanent basis"
OTH-THR	Threatening frame	The water crisis is framed as requiring threats to high users by management	"Warning", "penalties", "force them", disapproving tone, reference to citizens' legal responsibilities
OTH-CON	Conflict framing	The water crisis is framed as a fighting matter in opposition to the City and the people of Cape Town	Military language, "aggressive", "remain vigilant", "beat this together", "(water saving) heroes"

Appendix III

Frequency of key frames occurring in each item in each stream

Stream A							
Date of release	**Title**	**Frame 1**	**Frame 2**	**Frame 3**	**Frame 4**	**Frame 5**	**Frame 6**
29-03-2017	*29 March 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017y)*	*			*		
26-04-2017	*26 April 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017z)*			*			
30-05-2017	*30 May 2017: Executive Mayor's Budget Speech (City of Cape Town, 2017aa)*			*	*	*	
27-07-2017	*27 July 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ab)*			*	*		
16-08-2017	*16 August 2017: Executive Mayor's Statement- High Consumption Households (City of Cape Town, 2017ac)*		*	*	*		*
17-08-2017	*17 August 2017: Executive Mayor's Statement- Advancing Water Resilience (City of Cape Town, 2017ad)*		*	*			
23-08-2017	*23 August 2017: Executive Mayor's Statement- Grant Towards Drought Relief (City of Cape Town, 2017ae)*	*	*				
03-09-2017	*3 September 2017: Executive Mayor's Statement (City of Cape Town, 2017af)*			*	*	*	
19-10-2017	*19 October 2017: Executive Mayor's Statement- City Hosts 600 Business Sector Representatives (City of Cape Town, 2017ag)*	*					
26-10-2017	*26 October 2017: Executive Mayor's Full Council Meeting Speech (City of Cape Town, 2017ah)*	*	*		*		
30-10-2017	*30 October 2017: Executive Mayor's Statement (City of Cape Town, 2017ai)*	*					
10-2017	*Critical Water Shortages Disaster Plan Summary (City of Cape Town, 2017c)*	*		*	*	*	
02-11-2017	*2 November 2017: Refurbished Atlantis Aquifer Executive Mayor's Speech (City of Cape Town, 2017aj)*	*			*		
08-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017ak)*	*			*	*	
09-11-2017	*Executive Mayor's Statement (City of Cape Town, 2017al)*		*				
13-11-2017	*13 November 2017: Executive Mayor's Statement- Bad Weather Leads To Decline in Dam Levels (City of Cape Town, 2017am)*		*				*
15-11-2017	*15 November 2017: Executive Mayor's Statement- Removal Of Alien Vegetation at Wemmershoek Dam (City of Cape Town, 2017an)*	*	*		*		
16-11-2017	*16 November 2017: Executive Mayor's Statement- Day Zero (City of Cape Town, 2017ao)*			*	*	*	*
19-11-2017	*19 November 2017: Executive Mayor's Statement- Exploratory Work At Steenbras (City of Cape Town, 2017ap)*	*					
23-11-2017	*23 November 2017: Executive Mayor's Statement- City Launches Weekly Water Dashboard (City of Cape Town, 2017aq)*	*		*		*	*
26-11-2017	*26 November 2017: Executive Mayor's Statement- Aerial Mapping Of The Cape Flats Aquifier [sic] (City of Cape Town, 2017ar)*	*					
28-11-2017	*28 November 2017: Executive Mayor's Statement- Weekly Dashboard (City of Cape Town, 2017as)*			*			*
03-12-2017	*3 December 2017, Executive Mayor's Statement: Day Zero (City of Cape Town, 2017at)*			*			*
12-12-2017	*12 December 2017: Executive Mayor's Statement- Water Dashboard Reveals Alarming High Consumption Trend (City of Cape Town, 2017au)*			*		*	*
12-2017	*Pressure Reduction Guideline Summary (City of Cape Town, 2017j)*	*	*				
12-2017	*Water Rationing Dos and Don'ts Guideline (City of Cape Town, 2017s)*	*	*				
09-01-2018	*9 January 2018: Executive Mayor's Statement- City secures Bigger Yield From Aquifers- Water Usage Still Too High (City of Cape Town, 2018f)*	*		*		*	
11-01-2018	*11 January 2018: Executive Mayor's Statement- City Starts Drilling for Groundwater From Cape Flats Aquifer (City of Cape Town, 2018g)*	*					
11-01-2018	*11 January 2018: Executive Mayor's Statement- Proposed Drought Charge (City of Cape Town, 2018h)*		*				
16-01-2018	*16 January 2018: Executive Mayor's Statement- Cape Town Residents Must Reduce Consumption To Avoid Day Zero (City of Cape Town, 2018i)*			*		*	
18-01-2018	*18 January 2018: Executive Mayor's Statement -Day Zero Now Likely To Happen (City of Cape Town, 2018j)*			*			*
05-02-2018	*IDP Annexure: CT Drought Response (City of Cape Town, 2018c)*	*	*				
03-2018	*Collection and Use of Seawater for Household Purposes Guideline (City of Cape Town, 2018b)*		*				

Stream B							
Date of release	**Title**	**Frame 1**	**Frame 2**	**Frame 3**	**Frame 4**	**Frame 5**	**Frame 6**
11-04-2017	*Wemmershoek-1-2017 (City of Cape Town, 2017v)*		*				
11-04-2017	*Wemmershoek-2-2017 (City of Cape Town, 2017w)*		*				
11-04-2017	*Wemmershoek-3-2017 (City of Cape Town, 2017x)*		*				
19-04-2017	*Steenbras-May2017 (City of Cape Town, 2017o)*		*				
13-07-2017	*Theewaterskloof-2-Jul2017 (City of Cape Town, 2017q)*		*				
13-07-2017	*Theewaterskloof-Jul2017 (City of Cape Town, 2017p)*		*				
02-10-2017	*Find and Fix Leaks (City of Cape Town, 2017f)*					*	
04-10-2017	*Critical Water Shortages Disaster Plan presentation (City of Cape Town, 2017b)*	*			*		
11-10-2017	*Level 5 Water Restrictions Infographic (City of Cape Town, 2017h)*			*	*		
17-10-2017	*Water Saving Checklist (City of Cape Town, 2017t)*			*	*	*	
19-10-2017	*DIY Find and Fix Water Leaks Guide (City of Cape Town, 2017e)*					*	
26-10-2017	*Banner (City of Cape Town, 2017a)*					*	
03-11-2017	*Permission cubicle A4 Poster English (City of Cape Town, 2017i)*			*		*	
21-11-2017	*Water Rationing A4 poster (City of Cape Town, 2017r)*			*	*		
28-11-2017	*Water saving plumbing checklist (City of Cape Town, 2017u)*			*	*	*	
05-12-2017	*Save Like a Local Tourist Campaign- Pamphlet (City of Cape Town, 2017l)*			*	*	*	
05-12-2017	*Save Like a Local Tourist Campaign- Door Hanger- Poster (City of Cape Town, 2017k)*			*	*	*	
05-12-2017	*Save Like a Local Tourist Campaign-Tent Card- Poster (City of Cape Town, 2017n)*			*	*	*	
05-12-2017	*Save Like a Local Tourist Campaign- Poster (City of Cape Town, 2017m)*			*	*	*	
06-12-2017	*Guide on Water Rationing A4 Poster (City of Cape Town, 2017g)*		*		*		
19-12-2017	*CoCT Save like a local Residents Flags (City of Cape Town, 2017d)*			*	*	*	
01-02-2018	*Water Meters and Water Management Devices A4 Pamphlet (City of Cape Town, 2018d)*		*			*	
19-02-2018	*Water Outlook 2018 Presentation (City of Cape Town, 2018e)*	*	*				
02-2018	*City News, Issue 44: Day Zero Residents Newsletter (City of Cape Town, 2018a)*	*		*	*	*	